An Investigation of Individual Differences in Vocabulary Ability of High School Students

by

Emerson Brown, A.B.

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Approved by:

Instructor in Charge

Raymond D. Schwegler

Head of the Department

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From Superintendent W. T. Markham, Yates Center, Kansas, the author procured the test before its publication, as well as the data that he had already assembled.

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TABLES

CHAPTER I.

STATEMENT OF GENERAL PROBLEMS.

This investigation proposes to determine the differences in general reading vocabulary of the students of Marion, Florence, and Peabody High Schools, in particular, and of all the students of Kansas high schools of the size and classification of the above schools, in general.

Justification of this investigation is based upon three fundamental ideas and purposes. The first is that the influence of the pupil's vocabulary upon his school work demanding the use of a general reading vocabulary has been altogether too largely neglected; word lists of "most commonly used words," and tests designed for special and technical vocabularies are rather numerous, while no tests proposing to measure those words which belong neither to our everyday vocabulary nor to our technical vocabulary has until recently been formulated. Thus, the measurement of the pupil's general reading vocabulary in itself is a primary step in a larger investigation of the influence of general reading vocabulary upon school work.

In the second place, one of the biggest problems faced by modern educators is to provide adequate instruction for individual differences in general intelligence, and achievement in all school subjects that are found among pupils.

To what extent do we find individual differences in vocabulary ability.

Third, when this investigation was begun the Markham vocabulary test had not sufficient data to establish its validity. To establish further validity of this test is one of the purposes of this investigation.

CHAPTER II

METHODS OF INVESTIGATION.

The "Method of Tests and Statistics" (9, Jordan, Education Psychology, pp. 12-12) in general is the plan for the investigation.

Form A of the Markham Vocabulary Test was administered to the pupils of three Kansas high schools of the same classification (North Central Association), and ranking in size between 114 and 200 students. These three schools were selected because of the whole-hearted cooperation extended by the school authorities to assist in the administering of the tests, and in the collection of the other needed data; also, the investigator's home being in Marion, the nearness of the two other schools made possible the personal administration of all the tests under as nearly the same conditions as it was possible to secure.

Furthermore, the investigator believes these three schools to be representative and typical of North Central Association High Schools of one hundred to two hundred enrollment in the state of Kansas. Some reasons for this contention are: first, the size of the three schools represents the sizes to be found in the total number: Marion has 189 students; Florence, 125; and Peabody, 150; second, membership of the group of schools from which the sample is drawn in the North Central Association assures about equal housing, mechanical, teaching, and library facilities; third, Marion and Peabody have four year high schools, whereas Florence has a three year junior and a

three year senior high school; fourth, the population from which the students are drawn is predominatingly rural, although in Florence High School the population is more industrial--oil fields and railroad shops; (in a later chapter the occupational percentages will be given); fifth, the school population is almost entirely white (four negroes), with a large sprinkling of second and third generation immigrants, mostly derived from Teutonic stock; sixth, the schools compete on even terms with schools of the same size and classification in athletics, music, scholarship, debate, and other school activities; music, debate, and scholarship contests extend throughout Kansas, and include most of the schools of this size and classification.

The foregoing generalizations lead one to believe that these schools are typical, and are representative samples of the larger group. Since in the beginning of this investigation, no special effort was made to secure a true sample, no reference was made to the larger group in the title. However, the investigator believes that the reasons advanced justify him in assuming that the sample is representative; although primarily the investigation concerns only the students of the three schools, secondarily it concerns the students from North Central Association high schools of one hundred to two hundred population. With these reservations, the results in which a true sample is assumed can be taken by the reader for what he thinks they are worth.

Form I of the Markham Vocabulary Test was personally administered to the students of the three high schools.

The tests were given during the month of February, 1927.

The instructions given to the students are to be found on the front page of the test. (Appendix)

The following information was secured from each student: Name; age, years and months; sex; grade in school; parent's occupation; language used in home; entrance into high school from rural elementary school, or from city elementary school. Any information not gained from the students was taken from the records in the principal's office. Intelligence test scores made on the Terman Group Test used by the Florence and Peabody students and Otis Self-Administering Test used by the Marion students were secured. Only the intelligence scores of part of the senior class in the Peabody High School were available. In the Marion High School the Otis Self-Administering Test of Mental Ability, Higher Examination, Form A was administered by the investigator under as nearly as possible the same conditions as the vocabulary tests.

It was found that in so few homes (three) was any other language than English used that the problem of a foreign language in the home was discarded.

Form I was rearranged and a key was made to fit the new arrangement , thus simplifying the task of scoring, and making the procedure mechanical, and thereby increasing its objectivity.

The tests were scored by the investigator, and three assistants. All tests were rescored. When any errors were found in scoring, that test was scored a third time.

After scoring the tests, the information obtained with the scores was filed according to size of scores, by schools, classes, and sex. (Appendis) From this, the frequency distributions were made as the work progressed. Frequency distributions were made

from all the data, and not secured from adding distributions to secure the one needed. For example, a frequency distribution was made for the test as a whole; then a distribution was made for the classes. Thus, the total distributions could be checked one against the other,. When an error was found, the data were rechecked until the error was found. This made a large amount of work, but it contributed to the accuracy.

From each distribution the following measures were found: measures of central tendency--median and mean; measures of variability--standard deviation and range; measures of reliability--standard error of mean and standard deviation. Comparison of score difference was determined by mean difference and overlapping in terms of percent of inferior group reaching or exceeding the median of the superior group. Standard error of the mean difference was used as a measure of the reliability of the mean. All computations were made by use of a calculator, and were rechecked until accuracy was reasonably insured. All formulas used in computations are given in the Appendix. Relationship was measured by the coefficient of correlation, using the Otis Correlation Sheet.

After the above data were secured, they were made into tables, and from these data the writer has attempted some interpretations.

CHAPTER III

SIMILAR INVESTIGATIONS AND VOCABULARY TESTS

Since the tests that are designed primarily to ascertain the general reading vocabulary of high school students have been only recently constructed, there seems to be no study that parallels the one herein attempted. The investigator made an exhaustive search to find if such a study had been attempted, and if there is such a one, he was unable to discover it. Many similar studies have been made in school subjects, such as "Historical Information and Judgment in Pupils" (21)*, as well as in general intelligence and achievement in school subjects will be made as each individual problem is treated in the main body of this investigation.

Mr. W. T. Markham, in the preparation of the test that was used for this investigation, found the median and interquartile range of 1052 cases, as well as the median and interquartile range for each grade in high school. A summary of his results is given in Table I. of this investigation.

The reliability of the Vocabulary Test was established by self-correlation of Form I and Form II of 1052 cases, the correlation being, 1879 $\pm$ .0047; the correlation of the Vocabulary Test with Cross English Test scores was .58 $\pm$ .056; with teachers' grades was .54 $\pm$ .048; and with Otis Intelligence Test scores was .48 $\pm$ .009. The reliability established by the above correlation was assumed by the present investigator to be sufficiently accurate.

*Reference to the bibliography will be given by number. Thus the number in the parenthesis indicates the reference in the bibliography.

TABLE I

Condensed Summary of the Results of the Markham Vocabulary Test as Established by the Author.

Grade	Number	Median		Interquartile Range	
		Form I	Form II	Form I	Form II.
Freshman	158	65	66	55-78	56-80
Sophomore	349	73	76	61.5-83.5	64-87
Junior	450	82	85	71-92	72-96
Senior	95	90	91	81-101	82-102
TOTAL	1,052	76	78	65-89	66-92

The test itself is made up of 125 words appearing in sentences or phrases, opposite which are five words, one of which is synonomous with the word underlined in the phrase or sentense.* The student taking the test is to underline the correct synonym selected from the five choices. As rearranged by the investigator, the five choices are numbered; the student is to underline the correct synonym, and place its number in the parenthesis at the side of the page (see Appendix). The words are graduated from the less difficult to the more difficult.

The Inglis Vocabulary Test follows in the main the same arrangement as that of the Markham Vocabulary Test,. Since the Inglis Test was made first, and since Markham was a student of Inglis while the Inglis test was being constructed, Markham claims some advantages for his test; namely, the graduation of test items on the basis of difficulty.

* For a complete statement of the method used by W. T. Markham in the compilation of his test, reference should be made to his Master's Thesis, on file in the library of the University of Kansas.

According to the judgment of seven experts selected by T. S. Kelley, the Inglis Vocabulary Test is given a median rating of two for high school students, and of one for college students. (10 Kelley, Interpretation of Educational Measurements, pp. 214-287). Table II. gives the ratings as they appear in the table arranged by Kelley. (10, Kelley, op. cit., pp. 238-239).

TABLE II

Ranking of Tests (M) High School Reading Tests.

No. of Judges rating if less than 5	JUDGES A	B	C	D	E	F	G	Median Rating
Inglis, A., Vocabulary Test			2	3	1	5	1	2
Inglis., A., Vocabulary Test (for college)			1	3	2	1	1	1

1. Judge E states: "I find it hard to rank vocabulary and reading tests together. The Inglis stands higher in my regard than this rank would show, but not as a measure of reading."

The foregoing opinion of the relative value of the Inglis Vocabulary Test as a test, merely upon the opinion of the investigator, could be given equally as well for the Markham Vocabulary Test, because of the similarity of the two tests.

Neither of the tests has gone beyond the establishment of reliability and of grade norms. Perhaps the norms established by Markham are not sufficiently reliable as yet because of the number upon which they are based.

Either of the tests affords an adequate measure of general vocabulary ability, and can be used to secure data for a more detailed study of vocabulary, especially of individual difference and its cause.

SUMMARY

1. So far as the investigator has been able to ascertain, no study has been made of the vocabulary of high school students, such as has been made of achievement in school subjects, and general intelligence.

2. The Markham Vocabulary Test has secured sufficient correlation to establish its reliability. The self-correlation between the two forms is assumed to be sufficiently high to necessitate the use of only one form.

3. The Markham Vocabulary Test has been given to a sufficient number of pupils to establish temporary grade norms.

4. In the opinion of the investigator, value for the Inglis Vocabulary Test as established by judgment of test experts can be assumed as equally valuable for the Markham test because of the similarity of the two.

CHAPTER IV

THE RESULTS FROM THE TOTAL DISTRIBUTION

Table III. gives the results of the total number of scores. The obtained mean is 71.46 $\pm$ .8. The true mean in 99 chances out of 100 would fall within the limits of 3 x $\pm$ .8th mean, or within the limits of 68.06 and 75.86.

The sigma of the distribution is 17.3, which indicates that 68 out of 100 scores fall within the limits of 54. 16 and 88. 76. The true sigma in 99 chances out of 100 would fall within the limits of 15.71, and 18.89. (The true sigma is found by adding 3x $\pm$ .53 to the obtained sigma.)

Diagram I shows the total distribution drawn as a frequency polygon; superimposed in red is the curve drawn as the scores would appear if they followed the normal curve. Comparison of the two curves shows that the vocabulary scores approximate a normal curve. The frequency polygon is skewed positively .149. Several causes might operate to cause this situation: errors in scoring, too few cases, technical faults in the construction of the test, and errors of selection.

Skewness in this case may be a result of selection, since there are 249 Freshmen and Sophomores, and 209 Juniors and Seniors.

The range and frequency polygon show a wide span in vocabulary ability among high school students.

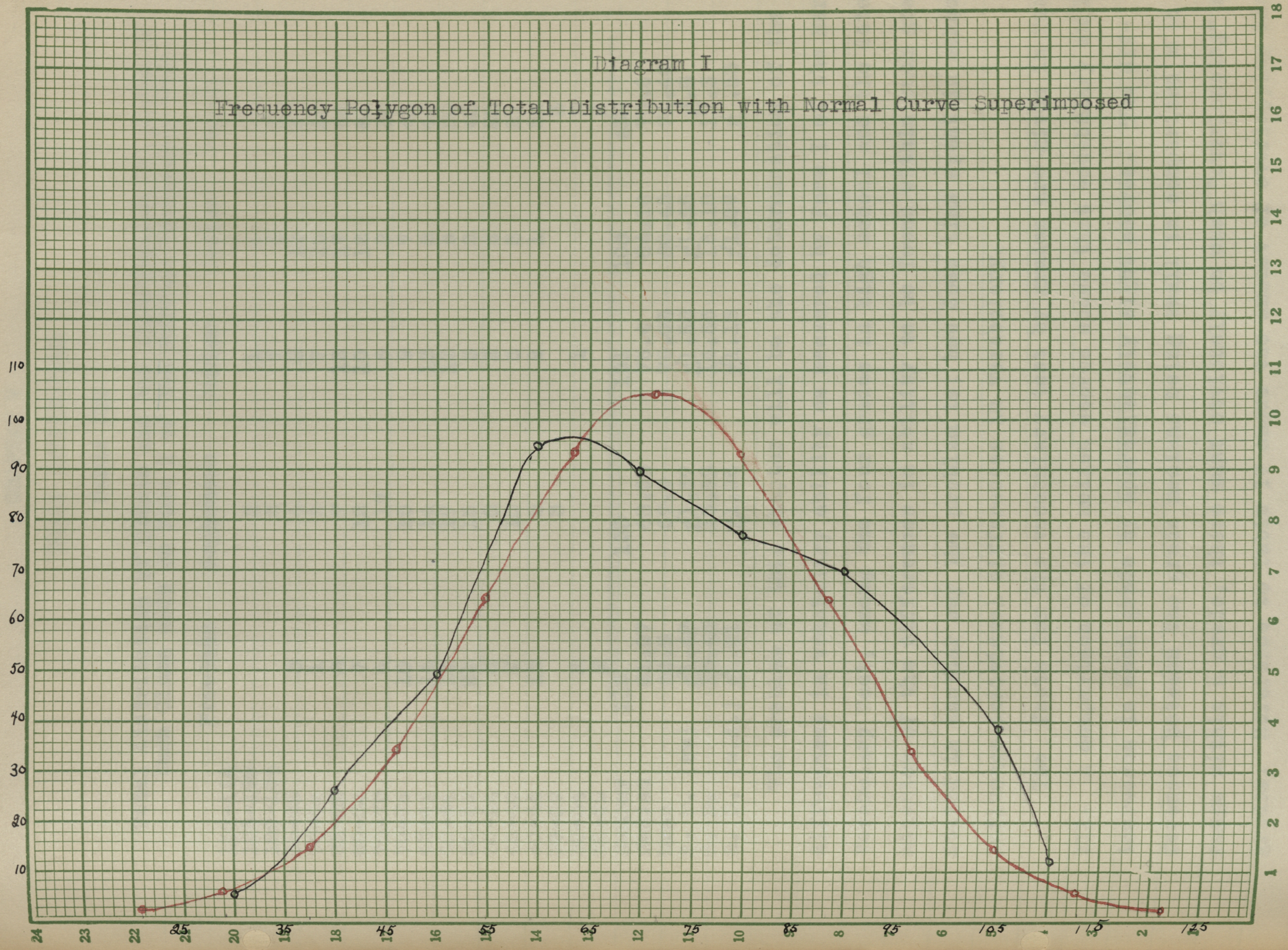
Diagram I
Frequency Polygon of Total Distribution with Normal Curve Superimposed

CHAPTER V

GRADE DIFFERENCES

Table III

Total distribution of Scores and the Distribution of Scores of Each Class made on Form I of the Markham Vocabulary Test.

	Freshman	Sophomore	Junior	Senior	Total
110-114				2	2
105-109		2	1	2	5
100-104		2	7	3	12
95-99	3	4	8	12	27
90-94	1	2	7	16	26
85-89	8	7	12	17	44
80-84	7	12	10	12	41
75-79	4	17	6	9	36
70-74	10	15	9	7	41
65-69	14	14	13	8	49
60-64	14	17	13	6	50
55-59	23	15	5	2	45
50-54	6	8	2	6	22
45-49	7	10	5	5	27
40-44	15	5	2	1	23
35-39		3			3
30-34	2		1		3
25-29	2				2
Number	116	133	101	108	458
Median	61.07	68.03	75.4	84.16	70.6
Mean	62.5	67.9	76.05	80.45	71.46
S. D. (av)	±1.43	±1.37	±1.58	±1.55	±.8
S. D.	15.45	15.85	16.65	16.10	17.3
S. D. (s.d.)	±1.01	±1.05	±1.18	±1.09	± .53

The problem of this chapter will be the determination of the differences in vocabulary ability as measured by Form I of the Markham Vocabulary Test, among the four grades in high school and the determination of the differences in ability to be found within each grade. Stated in another way the problem is; how does time spent in school influence individual differences in vocabulary.

The facts for the vocabulary test by grades are given in Table III. A comparison of the median scores shows that vocabulary ability increases in each grade by approximately eight scores. The differences between the grade medians being small in comparison with the range within a grade, there must obviously be much "overlapping" among grades. Reference to Table IV shows the amount of overlapping that exists among the grades. Reading the Table beginning with freshmen,

Diagram II

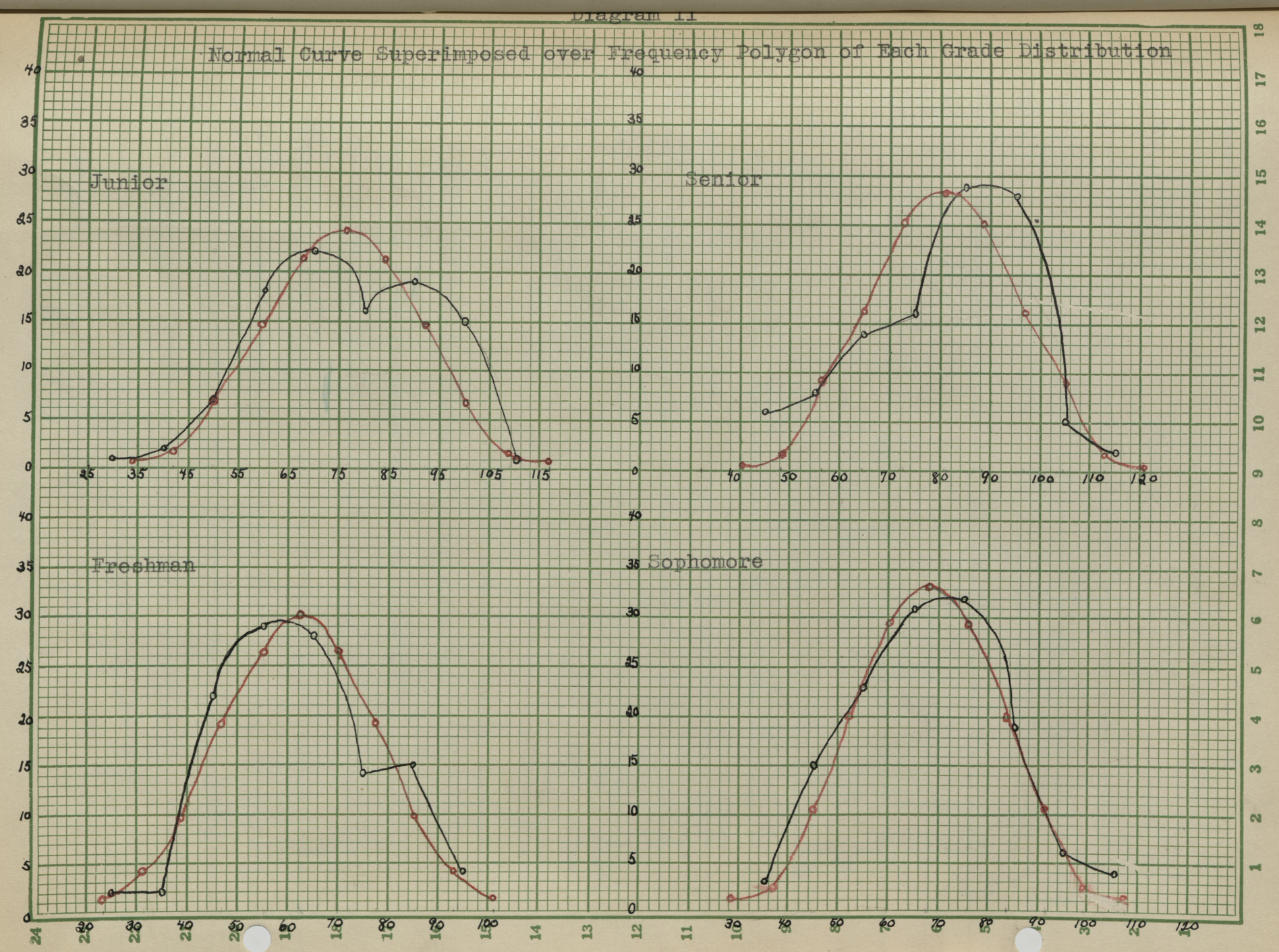
Normal Curve Superimposed over Frequency Polygon of Each Grade Distribution
Junior
Senior
Freshman
Sophomore

TABLE IV

Per Cent of Pupils in Each Grade whose Score Equalled or Exceeded the Median Score of Each Other Grade above it.

	Junior	Sophomore	Freshman
Senior	36.31	13.53	11.33
Junior		33.06	23.55
Sophomore			33.18

We find that 11.33 per cent of the freshmen; 13.53 per cent of the sophomores; and 35.31 per cent of the juniors either reached or exceeded the median score of the seniors. Reading down one line beginning with the freshmen, we find 23.55 per cent of the freshmen; and 33.06 per cent of the sophomores either reaching or exceeding the median score of the juniors. 33.18 per cent of the freshmen reach or exceed the median of the sophomores. Thus approximately one-third of the students in each class are equal to or superior to the next advanced grade and in each class there are some students equal to or superior to the median of the most superior grade, vis., "reading, spelling, historical information and judgment." (19 Van Wagenen, Historical Information and Judgment in Pupils, pp. 7) lacks considerable of being the same as classification according to ability.

TABLE V

Mean Difference between Grades with the Standard Error of the Difference

	Junior	Sophomore	Freshman
Senior	4.40 $\pm$ 2.21	12.55 $\pm$ 2.06	17.95 $\pm$ 2.10
Junior		8.15 $\pm$ 2.08	13.55 $\pm$ 2.12
Sophomore			5.4 $\pm$ 1.97

Providing that this is a true representative sampling, the reliability of the obtained mean shows that in 68 chances out of 100 the true mean would fall within the limits of the obtained mean plus and minus the standard error of the mean (Table III. S. D. (av). If the scores represent a valid sampling, in 99 chances out of 100 the true mean in the freshmen class will fall within the limits of 3 x $\pm$ 1.43 the

obtained mean, or within the limits of 58.21 and 66.79; in the sophomore class within the limits of 3 x $\pm$ 1.37 the obtained mean, or within the limits of 63.92 and 72.14; in the junior class within the limits of 3 x $\pm$ the obtained mean or within 71.31 and 80.79; and in the senior class within the limits of 3 x $\pm$ 1.55 the obtained mean or within 75.80 and 85.10.

Table V gives the mean difference between grades with the standard error of the difference. Reading Table V we find the seniors 4.40 scores superior to the juniors, 12.55 and 17.95 scores superior to the sophomores and freshman respectively. The juniors are 8115 scores superior to the sophomores and 13.55 scores superior to the freshmen. The sophomore class is 5.4 points superior to the freshman. The standard error of the difference shows that the true difference between classes will in each case be greater than zero except between the junior and senior class. The chances are 98 in 100 that the true difference will be greater than zero between the mean scores of the junior and senior classes.

TABLE VI

Distribution of Scores by Grades in the Marion High School

	Freshmen	Sophomore	Junior	Senior	Total
110-114				1	1
105-109		1		1	2
100-104		1	4	1	6
95-99	1	2	3	6	12
90-94		2	1	6	9
85-89	4	3	9	7	23
80-84	1	4	3	7	15
75-79		4	1	1	6
70-74	4	5	2	3	14
65-69	5	5	7	4	21
60-64	4	6	5	2	17
55-59	9	8	1		18
50-54	2	5	1		8
45-49	4	8	3	3	18
40-44	8	1		1	10
35-39		1			1
30-34	2		1		3
25-29	1				1
Number	45	56	41	43	185
Median	58.05	64.17	80.83	85.36	68.93
Mean	58.95	67.50	75.75	82.00	71.05
S. D.	16.10	16.25	17.60	15.45	17.80

TABLE VII

Distribution of Scores by Grades in the Florence High School

	Freshmen	Sophomore	Junior	Senior	Total
105-109		1		1	2
100-104		1	1		2
95-99		1	1	3	5
90-94			3	5	8
85-89	2	3		4	9
80-84	1	2	4	2	9
75-79		4		1	5
70-74	3	4	5	2	14
65-69	4	4	1	2	11
60-64	4	6	4	2	16
55-59	10	4	2		16
50-54	4	2		4	10
45-49	3	2	1	1	7
40-44	4	3			7
35-39		2			2
30-34					
25-29	1				1
Number	36	37	22	27	122
Median	58	66.87	73	83.75	66.73
Mean	56.35	67.50	75	80.90	68.85
S. D.	11.95	16.15	14.00	16.95	17.15

TABLE VIII

Distribution of Scores by Grades in the Peabody High School

	Freshmen	Sophomore	Junior	Senior	Total
110-114				1	1
105-109			1		1
100-104			2	2	4
95-99	2	1	4	3	10
90-94	1		3	5	9
85-89	2	1	3	6	12
80-84	5	6	3	3	17
75-79	4	9	5	7	25
70-74	3	6	2	2	13
65-69	5	5	5	2	17
60-64	6	5	4	2	17
55-59	4	3	2	2	11
50-54		3	1	2	6
45-49		1	1	1	2
40-44	3	1	2		6
Number	55	40	38	38	149
Median	69.5	72.5	77	81.33	75.9
Mean	70.65	71.45	76.60	83.60	74.90
S. D.	14.90	10.50	17.10	13.55	14.75

The limits within which the middle two thirds of each class fall are as follows: freshman, 46.6-77.5; sophomore, 51.24-82.94; junior 59.40-92.70; and senior 68.06-100.26.

Diagram II shows the distribution of each grade, superimposed in red is the normal probability curve. The distribution of each class shows striking similarity to the normal curve. The freshman frequency polygon is positively skewed .21; the sophomore frequency polygon is positively skewed .02; the junior polygon is positively skewed .11; and the senior polygon is negatively skewed .69. It is not surprising to find the distributions skewed when the total distribution of all the high school students is the one that should closely follow the normal curve. The unexpected feature is to find that within each class there are such marked differences in vocabulary ability. Differences among the classes show that time spent in school operates to increase vocabulary ability. (Of course, the same differences might be found among students of different age levels, approximating the same as

those in each grade, who have never attended high school.) However, differences exist within each class that present an educational problem that has not been solved by grade classification under the present plan.

As a further step in the investigation of grade differences the distributions of each of the high schools tested classified by grades with their medians, means and standard deviations are included in this chapter. Table V gives the results for the Marion High School. Table VI shows the results obtained from the scores in the Florence High School. Table VII gives the facts for the Peabody High School.

TABLE IX

Per Cent of Pupils in Each Grade in Each School Whose Score Equalled or Exceeded the Median Score in Each Other Grade Above it.

School	Grade	Junior	Sophomore	Freshman
	Senior	43	14	11
Marion	Junior		31	15
	Sophomore			33
	Senior	27	17	6
Florence	Junior		35	11
	Sophomore			23
	Senior	42	21	20
Peabody	Junior		43	40
	Sophomore			45

TABLE X

Mean Difference between classes in each of the high schools

School	Grade	Junior	Sophomore	Freshman
	Senior	9.61	17.86	26.41
Marion	Junior		8.25	16.80
	Sophomore			8.55
	Senior	5.9	13.40	24.45
Florence	Junior		7.5	18.65
	Sophomore			11.15
	Senior	7.00	12.15	12.95
Peabody	Junior		5.15	5.95
	Sophomore			.8

Summary

1. Grade medians show almost uniform difference between classes. Overlapping shows that about one-third of the students in each class equal or exceed the median score of the class immediately above. Every class has some students that equal or exceed the median of the senior class.

2. Differences between grade means demonstrate that there is almost complete certainty that the difference between each class will be greater than zero and in favor of the class that is classified higher.

3. The distributions of the separate schools show that in at least two classes there seems to be almost equal mean ability. The conclusion drawn is that this is a result of the make-up of the class that in this case seems to have had more innate ability or has been subject to extra-school influences that determined its score. Otherwise the differences between the classes of each school follow the same general direction as the classes taken as a whole.

4. The variability of the different classes is almost uniform.

5. The distribution of each class to a marked extent follows the normal probability curve.

6. Differences exist within each grade that present as much of an educational problem as differences between grades.

CHAPTER VI

Sex Difference

The problem of this chapter concerns the difference in general reading vocabulary that exists between boys and girls.

Comparing the total distributions made by each group will be the first step in this chapter. Of the total number tested 216 are boys and 242 are girls, thus approximately 37 per cent are boys. Table XII gives the total distribution of the boys with the median, mean, standard deviation and measures of reliability. Table XIII gives the same information for the girls as Table XII gives for the boys. The median superiority of the girls over the boys is 1.80. In terms of overlapping approximately 27 per cent of the boys reach or exceed the median of the girls.

Comparing the mean scores of each group, we find that in 99 chances out of 100 the true mean of the boys (providing this is a representative sampling) will fall within 3 x $\pm$ 1.20 the obtained mean of 70.60 or within the limits of 67.00 and 74.20; in 99 chances in a 100 the true mean of the girls will fall within 3 x $\pm$ 1.10 the obtained mean of 72.25 or within the limits of 69.95 and 75.55. The difference between the obtained means is 1.65 scores in favor of the girls. The mean difference in terms of chances $\left(\frac{\text{Diff.}}{\text{S. D. Diff.}}\right)$ shows that in 84 chances in 100 the difference between the two groups will be greater than zero.

The standard deviation of the boys is 17.65; thus the middle two thirds of the boys score between the limits of 52.95 and 88.25. The standard deviation of the girls distribution is 17.10; or the middle two thirds of the girls score between 55.15 and 89.35. Both groups seem to score mainly within the same limits.

To compare the variability of the boys as a group with that of the girls, the coefficient of variation will be determined.

TABLE XI

Distribution of the Total Number of Scores and the Total Number in Each Class made by the Boys on the Form I of the Markham Vocabulary Test

	Freshman	Sophomore	Junior	Senior	Total
110-114				1	1
105-109		1	1	1	3
100-104			4	3	7
95-99	2	1	4	5	12
90-94			3	7	10
85-89	1	3	4	9	17
80-84	2	5	5	6	18
75-79	2	8	3	5	18
70-74	3	9	5	3	20
65-69	5	5	5	5	20
60-64	9	8	7	2	26
55-59	11	11	2		24
50-54	4	4	1	2	11
45-49	3	4	1	5	13
40-44	7	3	1		11
35-39		2			2
30-34	1		1		2
25-29	1				1
Total	51	64	47	54	216
Median	59.32	65	75.83	84.17	69.5
Mean	60.05	66.05	76.75	80.10	70.60
S. D. (av.)	2.02	1.79	2.51	2.25	1.20
S. D.	14.45	14.35	17.10	16.55	17.65
S. D. (s. d.)	1.43	1.26	1.77	1.59	.85

TABLE XII

Distribution of the Total Number of Scores and the Total Number in Each Class made by the Girls on the Markham Vocabulary Test

	Freshman	Sophomore	Junior	Senior	Total
110-114				1	1
105-109		1		1	2
100-104		2	3		15
95-99	1	3	4	7	15
90-94	1	2	4	9	16
85-89	7	4	8	8	27
80-84	5	7	5	6	23
75-79	2	9	5	4	18
70-74	7	6	4	4	21
65-69	9	9	8	3	29
60-64	5	9	6	4	24
55-59	12	4	3	2	21
50-54	2	4	1	4	11
45-49	4	6	4		14
40-44	8	2	1	1	12
35-39		1			1
30-34	1				1
25-29	1				1
Total	65	69	54	54	242
Median	64.5	69.72	75	84.77	71.30
Mean	64.30	68.00	75.55	80.10	72.25
S. D. (av.)	2.07	1.90	2.29	2.09	1.10
S. D.	16.70	15.58	16.85	15.10	17.10
S. D. (s. d.)	1.46	1.35	1.62	1.48	.77

For the boys $V = \frac{100 \times 17.65}{216} = 81.71$; for the girls $V = \frac{100 \times 17.10}{242} = 70.66$. Expressed as a percent the girls are approximately 86 per cent as variably as the boys.

Thus from the total distribution compared we find the girls slightly superior in general reading vocabulary ability and also a little less variable than the boys.

The second step in this chapter will be to trace the sex differences between the two groups within each grade in high school. Table XI gives the median, mean, standard deviation, standard error of the average and standard deviation with the distributions for each grade. Table XII gives the same information for the girls.

TABLE XIII

Per cent of Boys Equalling or Exceeding the Median Accomplishment of the Girls in the Same Grade

Freshman	34%
Sophomore	35%
Junior	50%
Senior	50%

Table XIII gives the per cent of boys in each class reaching or exceeding the median of the girls. In the freshman and sophomore class there is the greatest difference; whereas, in both the junior and senior classes the two groups approach equality. An explanation of this condition will be reserved for a later part of the chapter.

TABLE XIV

Mean Difference between the Boys and Girls in Each Grade with the Standard Error of the Difference

Grade		Mean Difference	S. D. (diff.)
Freshman	girls exceed:	4.25	2.89
Sophomore	girls exceed:	1.95	2.60
Junior	boys exceed:	1.20	3.40
Senior	boys exceed:	.30	3.06

A glance at Table XIV shows the little difference between the two groups in each class. Interpeting the mean difference and standard error of the mean difference in terms of chances, we find that in 92 chances in 100 the difference in the freshman class will be greater than zero. In the sophomore class the chances are 77 in 100 that the difference will be greater than zero. In the junior class the chances are 64 in 100 that the mean difference will be greater than zero. In the senior class the chances are 55 in 100 that the mean difference will be greater than zero. In both the junior and senior grades the chances are in favor of superiority of the boys. Evidently we cannot say with any degree of confidence that either boys or girls tend to be superior in general reading vocabulary especially in the last three grades.

The middle two thirds of the boys in the freshman class score within the limits of 45.60 and 74.50; the middle two thirds of the girls in the freshman class score within the limits of 47.60 and 81.00. The middle two thirds of the boys in the sophomore class score within the limits 51.70 and 80.40; the middle two thirds of the girls score within the limits of 52.15 and 83.85. The middle two thirds of the boys in the junior class score within the limits of 59.55 and 93.95; the middle two thirds of the girls score within the limits of 58.70 and 92.40. The middle two thirds of the boys in the senior class score within the limits of 63.55 and 96.65; of the girls the middle two thirds score within the limits of 64.30 and 94.50. It is evident that not only do the two groups compare almost equally in their averages but they also score within the same limits on the test thus they seem about equal in variability.

The standard error of the standard deviation is given for the standard deviation of each of the groups. Uniformity is the chief

characteristic. To obtain the limits within which the true standard deviation will fall the standard error is multiplied by three and added and subtracted to the standard deviation. Table XV shows the limits within which in 99 chances in 100 the true standard deviation will fall. Another sample might rearrange the groups entirely so far as variability is concerned.

TABLE XV

The Limits within Which the True Standard Deviation will Fall (99 chances in 100) of Distribution of the Boys and Girls in Each Grade.

	Boys	Girls
Freshman	10.16 - 18.74	12.32 - 21.08
Sophomore	10.57 - 18.13	11.80 - 19.90
Junior	11.89 - 22.51	11.99 - 21.71
Senior	11.78 - 21.32	10.56 - 19.54

TABLE XVI

Distribution of Scores Made by the Boys in Each School in the Form I of the Markham Vocabulary Test

	Marion	Florence	Peabody
110-114	1		
105-109	1	1	1
100-104	3	1	3
95-99	6	2	4
90-94	3	3	4
85-89	5	6	6
80-84	8	3	7
75-79	3	1	14
70-74	6	9	5
65-69	9	4	7
60-64	10	8	9
55-59	4	8	6
50-54	7	4	3
45-49	6	5	1
40-44	1	3	2
35-39	2	1	
30-34			
25-29		1	
Number	84	60	72
Median	66.66	65.00	76.08
Mean	68.85	67.50	75.00
S. D.	19.10	17.40	14.90

Table XVII

Distribution of Scores Made by the Girls in Each School on the Form I of Markham Vocabulary Test

	Marion	Florence	Peabody
110-114			1
105-109	1	1	
100-104	3	1	1
95-99	6	3	6
90-94	6	5	5
85-89	18	3	6
80-84	7	6	10
75-79	3	4	11
70-74	8	5	8
65-69	12	7	10
60-65	8	8	8
55-59	8	8	5
50-54	4	4	3
45-49	11	2	1
40-44	4	4	4
35-39		1	
30-34	1		
25-29	1		
Number	101	62	79
Median	70.94	67.85	75.23
Mean	72.10	70.00	74.30
S. D.	17.80	16.80	15.25

According to the coefficient of variation expressed as a per cent the boys in the freshman class are 90.68 per cent as variable as the girls; in the sophomore class, the boys are 97.60 per cent as variable as the girls; in the junior class the boys are 85.26 per cent as variable; in the senior class the boys are 94.71 per cent as variable.

Noting the high and low scores in the distributions, we find one senior boy scoring in the 110-114 interval; and one senior girl in the same interval; in the low interval, 25-29, we find one freshman boy and one freshman girl.

So far as this investigation is concerned no discernible difference of any amount in variability between the two groups has been discovered.

The third step in this chapter will be to determine the difference between boys and girls in general reading vocabulary ability in each school.

Tables XVI and XVII give the facts for the two groups by schools. In terms of overlapping approximately forty one per cent of the boys in both the Florence and Marion High School reach or exceed the Median of the girls. In the Peabody High School approximately forty seven per cent of the girls reach or exceed the median of the boys. The mean difference in favor of the girls in Marion High School is 3.25; in the Florence High School 2.50. The mean difference in favor of the boys in the Peabody High School is .7.

Variability of each group in the same school is about the same.

The fourth step will be to summarize the differences and attempt an interpretation and explanation of the results found.

Summarizing the differences between the sexes, although very slight, the girls especially in the first two grades seem to be somewhat superior. This superiority may be the result of the slower maturity of the boys or more boys may tend to quit school as they grow older leaving the brighter ones in school. If the latter conclusion is true then the equality in the junior and senior years may be a result of selection rather than equal ability. Or the difference might be a result of a real sex superiority in vocabulary ability. Such a conclusion seems compatible with the summary given by Jordan showing sex differences. (9. Educational Psychology pp. 295) He contends that"fairly reliable" studies show girls to be better in "ability to memorize"....and to have "Greater linquistic ability: (a) better in languages; (b) better

on analogies test; (c) better on word building."

Conclusions of a few other investigators in other school traits and general intelligence show the lack of any unanimity as to sex difference. Guy M. Whipple (20 Sex Difference in Army Scores) concludes from his data that boys as a group are slightly superior to girls, a fact which may be due to the selective nature of the high school. Pressey concludes from one study (13 Sex Differences Shown by 2,544 School Children) "The girls average slightly higher in total score or general intelligence than the boys." More rapid development on the part of the girls is suggested as the most probable explanation. The foregoing reason has already been advanced by the investigator to account for the duperiority of the girls in the first two grades of high school. In a later study Pressey modifies his first conclusions(14 Further Data with Regards Sex Difference) by stating that "such sex differences in intelligence are of no practical importance.

As to the variability of the two groups (13 Pressey op. cit. pp. 340) Pressey finds a "remarkably greater variability among the boys than girls whereas Hollingsworth (6 Vocational Psychology pp. 232) concludes "....the evidence from these extensive experiments is, in all cases, that there is no sex difference in mental variability." Terman (16 Genetic Study of Genius ;;. 53), in explaining the preponderance of boys over girls in his study says, "the most commondexplanation of findings such as we are here concerned with is that the human male is more variable than the female. However, the mental test data bearing on sex variability are so inconsistent that it would be hard to say which way the weight of evidence lies." And thus the matter stands.

From this study the differences in both averages and vari-

ability are too slight to offer any educational problem. Both groups in the main are remarkably alike and we can use the same conclusion regarding vocabulary that Terman used respective to intelligence, (op. cit. pp. 262) namely "giftedness is evidently far more potent than sex in determining relative success in school subjects" or vocabulary as the case may be.

SUMMARY

1. Girls seem to be a little superior to boys in general vocabulary ability. This superiority comes chiefly in the freshman and sophomore year which may be a result of the slower maturity of the girls or may be a real sex difference. The boys are slightly superior in junior and senior years which may be caused by more boys quitting school than girls.
2. Little difference was discovered in variability.
3. In Marion and Florence the girls are slightly superior in vocabulary ability; in Peabody the boys are slightly superior.
4. Sex difference throws but little light on individual difference and offers no educational problem.

CHAPTER VII

DIFFERENCES IN GENERAL READING VOCABULARY BETWEEN PUPILS ENTERING HIGH SCHOOL FROM RURAL ELEMENTARY SCHOOLS AND CITY ELEMENTARY SCHOOLS

Of the total number of pupils tested, 134, or approximately 29%, entered high school from rural elementary schools. These 134 entered the high schools of Marion and Peabody since Florence is a consolidated district, thus drawing a negligible number of students from rural elementary schools. The scores of these 134 pupils will first be compared with all of the students in Marion, Peabody, and Florence, those of Florence being included in order to get as representative as possible a population of laborer and rural pupils from the city elementary schools.

Table XVIII shows the total distribution in each class, and the total distribution of all students who entered high school from rural elementary schools. Table XIX shows the total distribution in each class, and the total distribution of all students who entered high school from city elementary schools.

In the freshman class the rural elementary students comprise 31% of the entire class; in the sophomore class, 30%; in the junior class, 24%; and in the senior class, 31%.

Table XX shows the overlapping between the two groups. The freshman class shows the rural elementary pupils shmewhat superior in median overlapping; otherwise there are marked differences between the two groups within each class, and as a whole.

Reference to the data in Table XXI shows the students from the city elementary schools to be superior in each grade. In terms of chances, the difference between the two groups in the freshman

TABLE XVIII

Distribution of Total Scores and by Grades of the Students in the City High Schools from the Rural Elementary Schools on Form I of the Markham Vocabulary Test.

	Freshman	Sophomore	Junior	Senior	Total
100-104			2		2
95-99	1		1	4	6
90-94				2	2
85-89	2	1	1	4	8
80-84	2	2	1	6	11
75-79	1	1	3	3	8
70-74	3	5		3	11
65-69	4	7	2	3	16
60-64	7	6	5	1	19
55-59	4	4	1	3	12
50-54		4	2	1	7
45-49	1	7	4	3	15
40-44	8	1	2	1	12
35-39		1			1
30-34	2		1		3
25-29	1				1
Number	36	39	25	34	134
Median	61.43	62.08	62.5	78.33	64.47
Mean	59.50	63.75	64.90	75.30	65.10
S. D.(av)	±2.30	±1.77	±3.76	±2.81	±1.44
S. D.	13.85	11.05	18.80	15.90	16.60
S. D.(s.d.)	±1.63	±1.25	±2.65	±1.98	±1.02

TABLE XIX

Distribution of Total Scores and by Grades of the Pupils in in the City High Schools who entered from the City Elementary Schools

	Freshman	Sophomore	Junior	Senior	Total
110-114				2	2
105-109		2	1	2	5
100-104		2	5	3	10
95-99	2	4	7	8	21
90-94	1	2	7	14	24
85-89	6	6	11	13	36
80-84	5	10	9	6	30
75-79	3	16	3	6	27
70-74	7	10	9	4	30
65-69	10	7	11	5	33
60-64	7	11	8	5	31
55-59	19	11	4	1	35
50-54	6	4		5	15
45-49	6	3	1	2	12
40-44	7	4			11
35-39		2			2
30-34					
25-29	1				1
Number	80	94	76	75	325
Median	60.71	72.5	81.11	86.35	73.75
Mean	63.68	71.27	79.73	82.5	73.9
S. D. (av)	±1.63	±1.74	±1.65	±1.81	±.91
S. D.	14.60	16.90	14.40	15.75	16.50
S. D.(s.d.)	±1.15	±1.23	±1.17	±1.28	±.64

TABLE XX

Percent of Rural Elementary School Pupils in the City High Reaching or Exceeding the Median Score of the City Elementary School Pupils.

Freshman	52%
Sophomore	13%
Junior	20%
Senior	24%
Total	29%

TABLE XXI

Mean Superiority of Students Entering High School from the City Elementary Schools over those Entering from the Rural Elementary Schools.

Grade	Mean Difference	Standard Error of Mean Diff.
Freshman	4.18	±2.81
Sophomore	9.92	±2.47
Junior	14.83	±3.17
Senior	7.65	±3.32
Total	8.80	±1.70

class will in 93 chances in 100 be greater than zero. Absolute reliability exists in the sophomore and junior classes, whereas in the senior class in 99 chances in 100 the difference will be greater than zero. The difference between the totals shows that the true difference will always favor the city elementary school pupils. The investigator does not have an explanation for the results in the freshman class other than that in this instance the rural elementary school pupils for this particular year were more highly selected than in the three former years. In the senior year it would seem plausible that the two groups would draw nearer together because of

fact that many rural school students leave school.

Tables XVIII and XIX give the standard deviations with the standard error of the standard deviation of the two groups.

Data in Table XXII show the difference between grades; thus,

TABLE XXII

Mean Difference between Grades of the Rural Elementary Pupils and City Elementary Pupils in the City High School.

	Junior		Sophomore		Freshman	
	City	Rural	City	Rural	City	Rural
Senior	2.77	10.40	11.23	11.65	18.82	15.80
Junior			8.46	1.35	16.05	5.40
Sophomore					7.95	4.15

senior rural excels junior rural 2.77; senior rural excels sophomore rural 11.65; senior rural excels freshman rural 15.80. The city differences are read in the same way. The table shows a much sharper differentiation between the mean scores of the grades in the city except junior-senior than of the grades made by rural elementary school pupils. This condition can be attributed to two causes: first, perhaps each year the incoming rural students differ a great deal in ability from former rural elementary school pupils; or, the rural elementary school students do not improve so rapidly in the city high schools as do the city elementary school pupils.

So far, we have been comparing students from the rural elementary and city elementary schools in the city high school. From all the evidence we have, there can be but one conclusion; the ever superiority in general reading ability of the pupil from the city elementary school. Is this difference a result of poorer education in the rural elementary schools? Would the same difference be found if the group that attended the rural elementary school had attended the city elementary school? To throw some light on this question, let us examine the scores of the few rural students in each high school

TABLE XXIII

Distribution of Total Scores made on Form I of the Markham Vocabulary Test and by Grades in Marion and Peabody High Schools who entered from the City Elementary School.

	Freshman	Sophomore	Junior	Senior	Total
110-114				2	2
105-109		1	1	1	3
100-104		1	4	3	8
95-99	2	3	6	5	16
90-94	1	2	4	9	16
85-89	4	3	11	9	27
80-84	4	8	5	4	21
75-79	3	12	3	5	21
70-74	4	6	4	2	16
65-69	6	3	10	3	22
60-64	3	5	4	3	15
55-59	9	7	2	1	19
50-54	2	4		1	7
45-49	3	1		1	5
40-44	3	1			4
Number	44	57	54	49	204
Median	66.75	75.62	84	85.25	76.33
Mean	67.5	73.05	81.3	84.80	76.40
S. D.	14.95	14.40	13.45	14.70	15.40

TABLE XXIV

Distribution of Scores made on Form I of the Markham Vocabulary Test by Rural Pupils who entered High School from the City Elementary School.

	Marion	Peabody	Total	Florence	Total
105-109				1	1
100-104				1	1
95-99				1	1
90-94	2	3	5	2	7
85-89	2	3	5	3	8
80-84	2	2	4	3	7
75-79		3	3	1	4
70-74	2	3	5	2	7
65-69	4	3	7	2	9
60-64	4		4	3	7
55.59	4	1	5	6	11
50-54				1	1
45-49	1		1	4	5
40-45		1	1	4	5
35-39					
30-34					
25-29				1	1
Number	21	19	40	35	75
Median	66.84	75.5	72.00	64.16	69.16
Mean	65.00	76.70	73.10	66.65	70.1 ±1.94
S. D.	12.45	12.10	13.05	19.70	16.80 ±1.37

who attended a city elementary school, and entered the city high school directly from the city elementary school. Although the group is small, perhaps some value can be derived from comparing it with the group made up of students from the rural elementary school. Table XXIV gives the data for the rural group that received its elementary education in the city schools.

In Marion the rural student from the city elementary school is 8.40 superior to the rural student from the rural elementary school, whereas the city elementary school pupils as a whole are 14.40 scores superior.

In Peabody High School the rural student from the city elementary school is 7.60 points superior to the rural student from rural elementary school. In Florence there is no appreciable difference. Combined, the rural students from the city elementary schools outrank the rural students from the rural elementary schools by 5 scores. From this comparison it would seem that the quality of the education received in the rural school is a contributing factor in causing the inferiority of the rural student in general reading vocabulary. However, there is still a large difference when the influence of educational opportunity has been eliminated that inclines one to believe that the rural student is inferior in native ability.

To compare the variability of the rural elementary school pupils as a group with city elementary school pupils as a group using the coefficient of variation expressed as a per cent, we find that in the freshman class the city school group is 98% as variable; in the sophomore class, the rural school group is 73.21 per cent as variable; in the junior class, the city group is 62.36 per cent as variable; in the senior, the city group is 91.16 per cent as variable; and as a whole,

the city school group is 87.56 per cent as variable.

Thus, the rural elementary school pupils tend to be distinctly inferior, and more variable than the city elementary school pupils in the city high school.

Table XXV gives the data for city elementary school pupils in Marion and Peabody High Schools. Compared with the rural elementary school pupils in the two schools (Table XIX) the differences are even more pronounced than when compared with all the city elementary school students in the three schools.

TABLE XXV

Mean Superiority of the City Elementary School Students over the Rural Elementary School Students in Marion and Peabody.

Freshman	8.00
Sophomore	11.70
Junior	16.40
Senior	9.95
Total	11.30

Table XXVI gives the data for comparing the high school students who graduated from the rural elementary schools with those from the city elementary school in Peabody. Table XXVII gives the same information for Marion. In Table XXVIII the mean superiority of the students from the city elementary school is shown. Although the difference is large in each instance, the difference between the two groups is much greater in Marion. Evidently Marion does not get as good a selection of rural school graduates as does Peabody.

The findings in respect to general vocabulary differences seem thoroughly consistent with the findings of Jeffries (8 Jeffries, A Comparative Study of Pupils from Rural and Urban Grades in the Freshman Year of High Schools in Sumner County Kansas.) in general intelligence and ability in school subjects. Jeffries concludes from his

TABLE XXVI

Distribution of Total Scores made on Form I of the Markham Vocabulary Test and Grade Distributions of the Pupils in the Peabody High School who entered High School from the Rural Elementary School and the City Elementary School.

	Freshman		Sophomore		Junior		Senior		Total	
	Rural	City	Rural	City	Rural	City	Rural	City	Rural	City
110-114								1		1
105-109						1				1
100-104					1	1		2	1	3
95-99	1	1		1	1	3	2	1	4	6
90-94		1				3	2	3	2	7
85-89		2	1	5		3	1	5	2	10
80-84	2	3	1	9	1	2	1	2	5	12
75-79	1	3		4	3	2	3	4	7	16
70-74	1	2	2	1		4		2	3	10
65-69	4	1	4	1	1	2	2		11	6
60-64	5	1	4	2	2	1	1	1	12	5
55-59	1	3	1	1	1		1	1	4	7
50-54			2		1		1	1	4	1
45-49					1			1	1	1
40-44	2	1	1		2				5	1
Number	17	18	16	24	14	24	14	24	61	87
Median	65.25	76.66	65	76.66	65	82.5	76.33	85	67.04	78.75
Mean	66.91	74.15	65	74.75	67.86	81.65	77.86	82.5	69.10	78.45
S. D.	13.2	11.05	10.75	9.60	18.25	13.90	14.20	15.65	14.30	14.05

TABLE XXVII

Distribution of Total Scores made on Form I of the Markham Vocabulary Test and Grade Distributions of the Pupils in the Marion High School who Entered High School from the Rural Elementary & the City Elementary School

	Freshman		Sophomore		Junior		Senior		Total	
	Rural	City	Rural	City	Rural	City	Rural	City	Rural	City
110-114								1		1
105-109				1				1		2
100-104				1	1	3		1	1	5
95-99		1		2		3	2	4	2	10
90-94				2		1		6		9
85-89	2	2		3	1	8	3	4	6	17
80-84		1	1	3		3	5	2	6	9
75-79			1	3		1		1	1	5
70-74	2	2	3	2		2	3		8	6
65-69		5	3	2	1	6	1	3	5	16
60-64	2	2	2	4	3	2		2	7	10
55-59	3	6	3	5		1			6	12
50-54		2	2	3	1				3	5
45-49	1	3	7	1	3		3		14	4
40-44		2		1			1		7	3
35-39			1						1	
30-34	2				1				3	
25-29	1								1	
Number	19	26	23	33	11	30	18	25	71	114
Median	47.5	60	57.5	71.25	60.83	85	81	90.41	63.5	75.83
Mean	53.29	62.5	58.81	72.5	61.14	81.65	72	87.5	61.7	76.1
S. D.	17.10	14.35	11.75	16.95	19.90	13.10	16.95	12.90	17.7	17.05

investigation that, "the mental age for the urban group is one year and two months higher than it is for the rural groups" and that the "urban group is ahead of the rural group in all of the sets of scores in achievement, excepting those in arithmetic."

From these data it would seem that the graduate from the rural elementary school entering the city high school offers a real problem that is not ordinarily met by present day school procedure.

Summary

1. Comparison of students entering high school from the rural elementary school with pupils entering from the city elementary school shows the rural elementary school pupil to severely handicapped in general vocabulary ability.
2. The rural pupil entering high school from the city elementary school seems distinctly superior to the student from the rural elementary school but not eqmal to the student from the city.
3. Rural pupils do not seem to improve as rapidly as city elementary school pupils.
4. Some city high schools get a better selection of rural school pupils than others.
5. The rural school pupil in the city high school offers a real problem.

CHAPTER VIII

Differences in General Reading Vocabulary According to Occupation of Parents.

Four hundred thirty six pupils gave the occupation of their wage-earning parent sufficiently definite to permit of classification of occupational groups.

Taussig's five-grade classification was changed to suit the needs of the communities wherein the test was given. Agriculture was listed separately instead of being listed under skilled labor. Common labor and slightly skilled labor were thrown together. First, however, they were listed separately, but there was so little difference (mean difference of two scores) that the two were listed under one head. Otherwise Taussig's classification was followed.

In each of the classifications we have the following: I. Professional Group: physicians, lawyers, teachers, clergymen, dentists, United States Representative, engineers (with college degrees); total, 18.

II. Semi-professional and Business Group, including two subgrades of "white collar" workers below the professional level: a) executive and business managers, sales company owners, insurance agents, photographers, oil company superintendents; total, 14; b) retail dealers and owners of small stores, clerical workers, druggists, contractors, telegraph operators, postmen, post office clerks, civil service clerks, countyofficials; total; total of II. a) and b) 90.

III. Skilled Labor Group: carpenters, mechanics, machinists, tailors, painters, foremen, bakers, shoemakers, barbers, blacksmiths, locomotive engineers, printers, oil drillers, railway conductors, rig builders; total, 60

IV. Common to Semi-skilled Laborers; odd jobs, teamsters, expressmen, oil workers, pipe line walkers, truck men; total, 71.

V. Agriculture: total, 197.

The percentage distribution for these five classes is as follows:

Professional	3.93%
Semi-professional and Business	19.65%
Skilled Labor	13.76%
Common to Semi-skilled Labor	14.63%
Agriculture	43.01%
Unknown	4.80%

The above data show the preponderance of agriculture, and semi-professional and business in a small town. The limited number in the professional group is not truly indicative of the number of professional people, but is in part the result of the small families prevalent in the professional class. The labor group is largely made up of oil workers, and may not be a stable part of the communities in which they are found.

Table XXIX gives the distributions of each group with the median, mean, and standard deviations for each group.

Table XXX gives the mean difference between the groups. The table should be read: professional exceeds skilled labor 8.00; exceeds business 9.05, etc.

In terms of chances, the mean difference between professional and skilled labor will in 92 chances in 100 be greater than zero; the difference between professional and business will in 94 chances in 100 be greater than zero; the difference between professional and common to semi-skilled labor will in 99 chances in 100 be greater than zero. Between professional and agriculture there is complete reliability.

TABLE XXIX

Comparison of Group Classified as to Occupation

	Farmer	Common & Semi-skilled Labor	Business & Semi-Professional	Skilled Labor	Professional
110-114			1	1	
105-109	1		1	2	1
100-104	3	1	6		2
95-99	5	6	6	4	1
90-94	9	6	5	1	4
85-89	16	7	8	9	4
80-84	18	5	9	7	1
75-79	13	6	7	7	1
70-74	16	4	6	8	
65-69	24	6	14	5	
60-64	22	7	8	9	2
55-59	21	8	9	4	
50-54	6	7	6	1	1
45-49	20	4	3	1	
40-44	17	3		1	1
35-39	1	1	1		
30-34	3				
25-29	2				
Number	197	71	90	60	18
Median	66.35	69.58	73.53	75.71	88.75
Mean	66.85	71.10	75.10	76.15	84.15
S.D.(av)	±1.22	±2.04	±1.75	±1.86	±5.30
S. D.	17.15	17.20	16.65	14.40	17.10
S.D.(s.d.)	±.89	±1.44	±1.24	±1.31	±2.85

TABLE XXX

Mean Difference between Occupational Groups

	Skilled Labor	Business	Labor	Agriculture
Professional	8.00 ± 5.62	9.05 ± 6.41	13.05 ± 5.68	17.30 ± 5.44
Skilled Labor		1.05 ± 2.55	5.05 ± 2.75	9.30 ± 2.22
Business Semi-Professional			4.00 ± 2.49	8.25 ± 2.06
Semi-skilled				4.25 ± 2.52

The difference between skilled labor and semi-professional and business will in 65 chances out of 100 be greater than zero; the difference between skilled labor and common labor will in 96 chances in 100 be greater than zero. There is complete reliability between skilled labor and agriculture.

The difference between business-semi-professional and common-to-semi-skilled labor will in 94 chances in 100 be greater than zero; there is complete reliability that the difference will be greater than zero between business-semi-professional and agriculture.

The chances are 95 in 100 that the difference between skilled labor and agriculture will be greater than zero.

One interesting feature of occupational differences in general reading vocabulary is the slight superiority of the skilled labor group over business-and-semi-professional groups.

As to the cause of superiority of one group over another, it is difficult to say. The low position of the agriculture group has been partially explained by the quality of the education received in the rural elementary schools. Otherwise a good case could be made out for either environmental opportunity or inherited ability as the cause for the position of any occupational group.

Again, the big problem is not separation of classes, because we find students of all degrees of ability within each occupational group.

Summary

1. Occupational classification was made according to Taussig's five group plan except semi-skilled and common labor were included under one heading and that agriculture was made into a separate classification.
2. Superiority in vocabulary according to occupational grouping falls into the order named: professional, skilled labor, business and semi-professional, common to semi-skilled labor, and agriculture.
3. Differences within each group are more important than differences between groups.

CHAPTER IX

THE RELATIONSHIP BETWEEN INTELLIGENCE AND GENERAL READING VOCABULARY

To determine the relationship between general reading vocabulary and general intelligence, the coefficient of correlation between vocabulary test scores and general intelligence test scores was calculated.

From Florence, 114 Terman Group Test scores were available; from Peabody, only 30 Terman Group Test scores were available; in Marion, Otis Self-Administering Test of Mental Ability, Higher Examination Form A was administered to the student body under the same conditions as the vocabulary test had been administered. From these scores and the vocabulary scores coefficients of correlation were calculated. Chart I gives the correlation for the thirty intelligence test scores in Peabody High School to be .795 with P. E. r. $\pm$ .043. Chart II gives the correlation between general vocabulary scores and Terman Intelligence Test scores in the Florence High School to be .909 with P. E. r. $\pm$ .012. Chart III gives the coefficient of correlation between Otis Intelligence Test scores and vocabulary test scores in Marion High School to be .783 with P. E. r. $\pm$ .02.

The coefficients of correlation in all three cases denote a high relationship (3. Garrett, statistics in Psychology and Education, p. 298) between general intelligence and general vocabulary. So great is the relationship between the two traits that often times a vocabulary test is used as a general intelligence test. Terman says (Genetic Study of Genius, Vol. I. p. 25) ".....it is only necessary to point to the correlations of .85 to .95 which have been found between vocabulary scores and mental age on the entire scale. The

amount of this correlation was deemed to justify rejection of some candidates on vocabulary test alone." The coefficient of correlation between intelligence test scores and vocabulary scores is larger than the coefficients of correlation between intelligence test scores. (15. Ruch and Stoddard, Tests and Measurements in High School Instruction, pp. 220-221.)

Do intelligence tests and vocabulary tests measure the same thing? Some investigators seem to think so. Kelley, by a rather involved process, maintains (10. Kelley, Interpretation of Educational Measurements, p. 205) that according to "Symond's data suggests that no less than 95 percent of the National Intelligence Tests: Scale A, and the Thorndike-McCall Reading Test are basically measures of the same thing. Further, in view of the size of the population dealt with, this result has but a small chance of error. It may seem surprising that there is so much that is common between these two well-known tests, one called an intelligence test, and the other a reading test, but such is clearly indicated to be the case." Kelley also summarizes his contention (op. cit. pp. 208) by saying: "The community between different intelligence tests is about 95 per cent. The community between intelligence tests and achievement batteries is about 90 per cent. The community between intelligence tests and reading tests is about 92 per cent."

Disregarding the question of measuring the same thing, we can be sure that division of students and classification of students according to intelligence will also secure homogenous vocabulary groups.

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MARKHAM VOCABULARY TESTS FOR HIGH SCHOOL PUPILS

FORM I

PREPARED BY W. T. MARKHAM

Pupil_____ City_____

Age_____ Years____ Months_____ School_____

Sex_____ Date of Test_____ Grade in School___

Parent's Occupation_____ Did you enter high school from city or rural school?_____

On the following pages you will find a list of one hundred twenty-five sentences and expressions. In each sentence or expression there is an underlined word. Following each sentence or expression is a list of FIVE words. You are to select the word in each list that most nearly corresponds in meaning to the underlined word in the sentence or expression and draw a line under it, and then put its number in the parenthesis. Do not hurry. This is not a speed test. It is to test your knowledge of words.

TOTAL NUMBER CORRECT_____

1. They made the alteration. 1. garment. 2. subway. 3. compact. 4. hill. 5. change.....( )
2. A bright metal. 1. counterfeit. 2. shining. 3. hard. 4. rough. 5. heavy.....( )
3. The inmates will suffocate. 1. starve. 2. choke. 3. survive 4. break away. 5. mutiny.....( )
4. It is astonishing. 1. bad. 2. thorough. 3. furious. 4. amazing. 5. stormy.....( )
5. A low bank shields us. 1. house. 2. mound. 3. stack. 4. curtain. 5. tide.....( )
6. She sat in pensive mood. 1. flamboyant. 2. thoughtful. 3. frightful. 4. quarrelsome. 5. mirthful.....( )
7. A musical instrument. 1. surgical. 2. culinary. 3. pointed 4. melodious. 5. destructive.....( )
8. A synopsis was given. 1. summary. 2. drama. 3. system. 4. fonus. 5. vacation.....( )
9. A purple glance. 1. cover. 2. beam. 3. ray. 4 color. 5. dart of light.....( )
10. They examined the mummy. 1. moron. 2 inmate. 3 wounded king 4. Shah. 5. embalmed body.....( )
11. They are beyond our care. 1. past. 2. in. 3. sent through 4. chiefly. 5. entirely.....( )
12. A sincere remark. 1. cutting. 2. hurried. 3. sarcastic 4. clumsy. 5. honest.....( )
13. He complains continually. 1. growls. 2. murmurs. 3. sings 4. laughs. 5. prays.....( )
14. They viewed the deceased. 1. quarry. 2. sepulcher. 3 milk-wagon. 4. corpse. 5. old nest.....( )
15. A distressing howl. 1. wail. 2. moment. 3 incident. 4. scene. 5. thought.....( )
16. We shot the drake. 1. pellican. 2. male-duck. 3. wild goose. 4. marsh-hawk. 5. grouse.....( )
17. The statement was accurate. 1. accepted. 2. correct. 3. important. 4. wrong. 5. complete.....( )
18. They took the census. 1. order. 2. money. 3. enumeration. 4. paperfile. 5. bank-book.....( )
19. The man was abusive. 1. insulting. 2. drunk. 3. angry. 4. crazy. 5. scared.....( )
20. He had a premonition. 1. intention. 2. pattern. 3. thought 4. forewarning. 5. cartridge.....( )
21. A complete idea. 1. private bath. 2. parachute. 3. fuse. 4. thought. 5. observance.....( )
22. An abnormal situation. 1. common. 2. unusual. 3. blackened 4. hopeful. 5. good.....( )
23. A giant bowlder. 1. cactus. 2. tree. 3. turtle. 4. panther 5. stone.....( )
24. A forgivable action. 1. traiterous. 2. offensive. 3. hasty. 4. cowardly. 5. pardonable.....( )
25. They met for a conference. 1. interview. 2. musical. 3. crowd. 4. contest. 5. camp-party.....( )
26. A complete cycle. 1. term. 2. course. 3. day. 4. revolution. 5. conjuction.....( )
27. He went into retirement. 1. auto-salvage. 2. seclusion. 3. gerry-mandering. 4. spasms. 5. repair-work.....( )

28. A fearful calamity. 1. exciting. 2. great. 3. impressive. 4. uncalled for. 5. terrible.....( )
29. They relieved the tension. 1. mortage. 2. sufferer. 3. strain. 4. party. 5. students.....( )
30. The eddy is dangerous. 1. whirlpool. 2. glacier. 3. country. 4. storm. 5. river.....( )
31. An azure sky. 1. blue. 2. gray. 3. clowded. 4. smoky. 5. crimson.....( )
32. You stress the wrong point. 1. emphasize. 2. attack. 3. omit. 4. select. 5. believe.....( )
33. The event was disastrous. 1. news. 2. incident. 3. decision. 4. meeting. 5. evidence.....( )
34. A sacred prayer. 1. able. 2. Pharisaic. 3. consecrated 4. Chinese. 5. voluminous.....( )
35. She is pledged to us. 1. kind. 2. faithful. 3. rude. 4. sent. 5. promised.....( )
36. A perfect model. 1. person. 2. imp. 3. pattern. 4. engraving. 5. caricature.....( )
37. They engaged in a skirmish. 1. artillery-fire. 2. repartee 3. debate. 4. search. 5. light combat.....( )
38. Bluing colors the water. 1. ink. 2. blood. 3. indigo. 4. red-lead. 5. paint.....( )
39. His backer refused. 1. supporter. 2. companion. 3. coachman. 4. employer. 5. wife.....( )
40. A mass of coagulum. 1. corn. 2. sugar. 3. rope. 4. clotted blood. 5. ants.....( )
41. He gave a sample. 1. dose. 2. assignment. 3. treatment. 4. specimen. 5. song-book.....( )
42. The sentence is incomplete. 1. short. 2. imperfect. 3. descriptive. 4. vulgar. 5. incorrect.....( )
43. He read the brief. 1. article. 2. summary. 3. warrant 4. text. 5. book.....( )
44. We confide in our friends. 1. depend. 2. trust. 3. rely 4. believe. 5. repose.....( )
45. They quote your poem. 1. refuse. 2. portray. 3. shun 4. believe. 5. repeat.....( )
46. They disperse the crowd. 1. entertain. 2. scatter. 3. provoke. 4. dispose. 5. disarm.....( )
47. A counterfeit dollar 1. silver. 2. Mexican. 3. spurious 4. fore-foreign. 5. bottom.....( )
48. I claim certain rights. 1. request. 2. demand. 3. beg. 4. imply. 5. refuse.....( )
49. They quake when he speaks. 1. shout. 2. cheer. 3. come 4. tremble. 5. retreat.....( )
50. Our fare was paid. 1. bill. 2. price. 3. part. 4. passage 5. interest.....( )
51. A titanic force 1. army. 2. naval. 3. artistic. 4. fairy 5. gigantic.....( )
52. He was skilled in mimicry. 1. entertaining. 2. derision. 3. ridicule. 4. photography. 5. imitation.....( )
53. A noted man 1. kind. 2. distinguished. 3. steady. 4. indebted. 5. educated.....( )
54. They loaded the galleon. 1. shot-gun. 2. dice. 3. bat. 4. large ship. 5. elevator.....( ))

55. A restful hamlet. 1. valley. 2. stream. 3. song. 4. painting 5. village.....( )
56. We benumb our senses 1. enliven. 2. rob. 3. entangle 4. educate. 5. stupefy.....( )
57. They lament the loss. 1. overcome. 2. forget. 3. bewail. 4. impose. 5. transfer.....( )
58. A greedy heron. 1. pig. 2. person. 3. waterfowl. 4.nature 5. thought.....( )
59. He discharged the agent. 1. captive. 2. manager. 3. representative. 4. janitor. 5. help.....( )
60. A polyhedral solid. 1. many-sided. 2. smooth. 3. hexagonal. 4. square. 5. cubical.....( )
61. A random remark. 1. quick. 2. putrid. 3. aimless. 4. shameful. 5. flat.....( )
62. Doff your hats. 1. put on. 2. change. 3. put off. 4. color. 5. burn.....( )
63. We stayed at the hostelry. 1. barn. 2. depot. 3. inn 4. asylum. 5. farm.....( )
64. We gave him a byzantine. 1. farm. 2. buzzard. 3. wife. 4. large gold coin. 5. copper.....( )
65. The turmoil was great. 1. mud. 2. foam. 3. agitation. 4. waterfall. 5. whirlpool.....( )
66. We convoy the fleet. 1. send. 2. summon. 3. entertain. 4. assemble. 5. protect.....( )
67. You have capillary tubes. 1. long. 2. inner. 3. hair-like 4. boiler. 5. rubber.....( )
68. We gave them odds. 1. shares. 2. bonds. 3. interest. 4. the dickens. 5. advantage.....( )
69. The author of our being. 1. books. 2. thoughts. 3. manners. 4. existence. 5. stories.....( )
70. An irate parent. 1. indulgent parent. 2. kind. 3. wrathful 4. unpopular. 5. only.....( )
71. An insipid liquid. 1. bitter. 2. sweet. 3. dark. 4. poison. 5. tasteless.....( )
72. A rustic lad. 1. rural. 2. school. 3. urban. 4. ugly. 5. promising.....( )
73. The article has coherence. 1. beauty. 2. strength. 3. wealth. 4. sense. 5. consistency.....( )
74. She was very demure. 1. haughty. 2. sleepy. 3. quaint. 4. bold. 5. modest.....( )
75. A beautiful medallion. 1. scroll. 2. flower. 3. debutant 4. antique. 5. medal.....( )
76. An arrogant.man 1. friendly. 2. mean. 3. haughty 4. large. 5. polite.....( )
77. They were versed in mythology. 1. science. 2. history 3. buffoonery. 4. astrology. 5. fabulous opinions.....( )
78. The jobber spoke fluently. 1. parrot. 2. mid-shipman. 3. middleman. 4. organizer. 5. candidate.....( )
79. Their condition is deplorable. 1. good. 2. strengthened 3. lamentable. 4. restored. 5. unusual.....( )
80. The house was razed. 1. removed. 2. built. 3. leveled-to-the-ground. 4. covered. 5. packed.....( )
81. The child is impertinent. 1. rude. 2. bright. 3. peevish 4. sickly. 5. quarrelsome.....( )
82. A large conch 1. negro. 2. tree. 3. shell. 4. fish. 5.maid( )

83. An opinionated man. 1. conceited. 2. vain. 3. profane
4. humble. 5. courageous.....( )
84. An aquatic bird. 1. large. 2. land. 3. water.
4. dangerous. 5. beautiful.....( )
85. The figure is dihedral. 1. beautiful. 2. symmetrical.
3. oblique. 4. octagon. 5. two-sided.....( )
86. The isolation was thorough. 1. incubator. 2. isotherm.
3. insulation. 4. operation. 5. imitation.....( )
87. The effervescence continued. 1. bubbling. 2. procession
3. argument. 4. stream. 5. moaning.....( )
88. A splendid orthographer. 1. photographer. 2. speller
3. engraver. 4. poet. 5. historian.....( )
89. We visited a cascade. 1. spot. 2. earthquake. 3. glacier
4. waterfall. 5. mountain.....( )
90. A flattering compliment. 1. generous. 2. false.
3. pleasing. 4. reckless. 5. deserved.....( )
91. The pinion broke. 1. crank-shaft. 2. lever. 3. rope
4. bar. 5. cog-wheel.....( )
92. His inflexibleness was unmoved. 1. emotion. 2. compassion. 3. purpose. 4. opinion. 5. obstinacy.....( )
93. The fagot was lost. 1. cream-bottle. 2. jug.
3. bundle of sticks. 4. pot. 5. cigarette.....( )
94. They buffet the child. 1. pet. 2. beat. 3. love.
4. humor. 5. tolerate.....( )
95. He exercised prudence. 1. care. 2. caution. 3. cunning. 4. craft. 5. stealth.....( )
96. A haughty janizary. 1. general. 2. ruler. 3. brigand.
4. Turkish soldier. 5. Egyptian Prince.....( )
97. He succeeded by lucubration. 1. thrift. 2. hardihood.
3. night study. 4. head work. 5. deceit.....( )
98. They hatchel the flax. 1. grow. 2. comb. 3. cut
4. bind. 5. thresh.....( )
99. You may expunge the sentence. 1. analyze. 2. correct.
3. erase. 4. use. 5. add.....( )
100. A mild physiognomy. 1. temper. 2. answer. 3. countenance. 4. temperament. 5. saying.....( )
101. The gavel sounded. 1. bugle. 2. drum. 3. mallet.
4. earth. 5. rain-barrel.....( )
102. The extirpator of evil. 1. teacher. 2. progenitor.
3. champion. 4. eradicator. 5. solicitor.....( )
103. A nocturnal occurance. 1. slow. 2. negative. 3. nightly
4. regular. 5. needed.....( )
104. A desolate malefactor. 1. rogue. 2. drunkard. 3. officer
4. criminal. 5. Frenchman.....( )
105. The esplanade was crowded. 1. street. 2. fair ground
3. sidewalk. 4. hall. 5. open level place.....( )
106. An overt act. 1. clownish. 2. open. 3. quick.
4. legislative. 5. selfish.....( )
107. Chyle is necessary to life. 1. digested food. 2. air
3. water. 4. oxygen. 5. salt.....( )
108. A rodent animal. 1. roaming. 2. vanishing. 3. historic
4. gnawing. 5. monstrous.....( )
109. They manifest a lovely disposition. 1. possess.
2. encourage. 3. spoil. 4. entertain. 5. reveal.....( )

110. We garner the grain. 1. harvest. 2. plant. 3. store. 4. shock. 5. thresh.....( )

111. A penurious man. 1. dangerous. 2. shameless. 3. dirty 4. indigent. 5. rich.....( )

112. He reached a state of affluence. 1. mind. 2. honor. 3. affairs. 4. wealth. 5. dignity.....( )

113. His satire was amusing. 1. irony. 2. story. 3. experience. 4. makeup. 5. emotion.....( )

114. They caught a finback. 1. cold. 2. whale. 3. muskrat. 4. woodchuch. 5. fish.....( )

115. They were placed in juxtaposition. 1. contiguity. 2. pairs. 3. lines. 4. columns. 5. conformity.....( )

116. His constituancy failed him. 1. constitution. 2. recklessness. 3. children. 4. electors. 5. mission.....( )

117. A lenghty proem 1. preface. 2. sentence. 3. speech 4. essay. 5. description.....( )

118. Parsimony is his worst fault. 1. swearing. 2. stinginess. 3. laziness. 4. slothfulness. 5. lying.....( )

119. The fumes nauseate. 1. disgust. 2. pledge. 3. kill. 4. increase. 5. overpower.....( )

120. They pawn their jewels. 1. sell. 2. rent. 3. pledge 4. borrow. 5. wear.....( )

121. We commend his rectitude. 1. company. 2. simplicity. 3. gallantry. 4. integrity. 5. fluency.....( )

1221 A lambent caress 1. haughty. 2. light. 3. obnixious 4. loving. 5. cherished.....( )

123. A tiresome periphrasis. 1. person. 2. walk. 3. journey. 4. essay. 5. circumlocution.....( )

124. A purulent disease. 1. dangerous. 2. obnoxious. 3. loathsome. 4. pus-forming. 5. degenerate.....( )

125. A long foot-stalk. 1. pole. 2. stem. 3. ear. 4. petiole. 5. shrub.....( )

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KEY TO MARKHAM VOCABULARY TEST FOR HIGH SCHOOL PUPILS

FORM I

1. change	(5)	26. revolution	(4)
2. shining	(2)	27. seclusion	(2)
3. choke	(2)	28. terrible	(5)
4. amazing	(4)	29. strain	(3)
5. mound	(2)	30. whirlpool	(1)
6. thoughtful	(2)	31. blue	(1)
7. melodious	(4)	32. emphasize	(1)
8. summary	(1)	33. incident	(2)
9. dart of light	(5)	34. consecrated	(3)
10. embalmed body	(5)	35. promised	(5)
11. past	(1)	36. pattern	(3)
12. honest	(5)	37. light-combat	(5)
13. murmurs.	(2)	38. indigo	(3)
14. corpse	(4)	39. supporter	(1)
15. wail	(1)	40. clotted-blood	(4)
16. male-duck	(2)	41. specimen	(4)
17. correct	(2)	42. imperfect	(2)
18. enumeration	(3)	43. summary	(2)
19. insulting	(1)	44. trust	(2)
20. fore-warning	(3)	45. repeat	(5)
21. thought	(3)	46. scatter	(2)
22. unusual	(2)	47. spurious	(3)
23. stone	(5)	48. demand	(2)
24. pardonable	(5)	49. tremble	(4)
25. interview	(1)	50. passage	(4)

51. gigantic (5)
52. imitation (5)
53. distinguished (2)
54. large ship (4)
55. village (5)
56. stupify (5)
57. bewail (3)
58. saterfowl (3)
59. representative (3)
60. many-sided (1)
61. aimless (3)
62. put-off (3)
63. inn (3)
64. large gold coin (4)
65. agitation (3)
66. protect (5)
67. hair-like (3)
68. advantage (5)
69. existence (4)
70. wrathful (3)
71. tasteless (5)
72. rural (1)
73. consistency (5)
74. modest (5)
75. medal (5)
76. haughty (3)
77. fabulous opinions (5)
78. middle-man (3)
79. lamentable (3)
80. leveled to the gr. (3)
81. rude (1)
82. shell (3)
83. conceited (1)
84. water (3)
85. two-sided (5)
86. insulation (3)
87. bubbling (1)
88. speller (2)
89. waterfall (4)
90. pleasing (3)
91. cog wheel (5)
92. obstinancy (5)
93. bundle of sticks (3)
94. beat (2)
95. caution (2)
96. Turkish soldier (4)
97. night study (3)
98. comb (2)
99. erase (3)
100. physiognomy (3)
101. mallet (3)
102. eradicator (4)
103. nightly (3)
104. criminal (4)

105. open level place (5)
106. open (2)
107. digested food (1)
108. gnawing (4)
109. reveal (5)
110. store (3)
111. indigent (4)
112. wealth (4)
113. irony (1)
114. whale (2)
115. contiguity (1)
116. electors (4)
117. preface (1)
118. stingyness (2)
119. disgust (1)
120. pledge (3)
121. integrity (4)
122. light (2)
123. circumlocution (5)
124. pus-forming (4)
125. petiole (4)

*****

School Marion High School

Grade Senior — Vocabulary Test: Markham Form I

Sex Male — Intelligence Test: Otis Self-Administering.

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	111	65	18-2	Undersheriff	
2.	103	59	19	Laborer	
3.	99	60	17-4	----------	
4.	99	54	18-1	----------	
5.	94	52	18-1	Laborer	
6.	91	49	19-11	Farmer	
7.	85	55	19-1	Contractor	
8.	84	53	16-11	Grain Elevator	
9.	83	51	17-3	Farmer	X
10.	80	50	17-6	Sales Manager	
11.	74	58	18-10	Carpenter	
12.	72	36	-----	Farmer	X
13.	69	50	18-7	Farmer	
14.	68	34	19-7	Farmer	
15.	65	53	19-4	Farmer	
16.	63	43	18-10	Mail Carrier	
17.	47	38	17	Farmer	X
18.	46	40	20-2	Farmer	X
19.	45	20	18-3	Farmer	X

School: Marion High School

Grade: Senior — Vocabulary Test: Markham Form I

Sex: Female — Intelligence Test: Otis Self Administering

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	106	51	16-7	Barber	
2.	97	45	17-3	Farmer	X
3.	96	49	17-7	Farmer	X
4.	96	48	17-11	Grocerman	
5.	95	59	17-9	Mechanic (Auto)	
6.	92	59	17-9	Lawyer	
7.	92	53	19-1	Salesman	
8.	91	64	16-6	Farmer	
9.	90	51	17-11	Journalist	
10.	89	47	17-3	Farmer	
11.	87	37	18-7	Farmer	X
12.	86	50	18-6	Oil Caser	
13.	85	47	18	Doctor (M. D.)	
14.	85	37	17-2	Farmer	X
15.	85	38	18	Farmer	X
16.	84	38	18	Farmer	X
17.	84	40	20	Farmer	X
18.	84	38	16-11	Farmer	X
19.	82	47	18-8	Farmer	X
20.	75	36	19-5	Farmer	X
21.	74	48	17-9	Farmer	X
22.	69	45	19-3	Farmer	X
23.	60	41	17-11	Salesman	
24.	44	46	18	Farmer	X

School: Marion High School

Grade: Junior Vocabulary Test: Markham Form I

Sex: Male Intelligence Test: Otis Self-Administering

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	101	61	17-1	Business	
2.	100	54	18-2	Farmer	X
3.	96	49	16-1	Grain Elevator	
4.	95	54	16-2	Postmaster	
5.	93	54	16-3	County School Supt.	
6.	88	57	17-4	Laborer	
7.	87	48	17-1	Oil Truck	
8.	83	--	16-11	Memorial Craftsman	
9.	80	46	17-2	Insurance	
10.	68	47	17-3	Business	
11.	66	40	17-11	Engineer (Elec.)	
12.	63	44	16-2	Farmer	X
13.	60	45	18*7	Farmer	
14.	60	43	17-5	Farmer	X
15.	60	41	17-6	Barber	
16.	46	30	18-9	Farming	X
17.	31	31	17-3	Farmer	X
18.	31	31	17-3	Farmer	X

School: Marion High School

Grade: Junior — Vocabulary Test: Markham Form I

Sex: Female — Intelligence Test: Otis Self-Administering

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	100	44	16-3	Doctor (M. D.)	
2.	100	61	15-6	Lumber Yard (prop)	
3.	98	56	17-6	Laborer	
4.	89	--	16-3	Farmer	X
5.	88	56	17-3	Farmer	
6.	88	47	16-14	Land Overseer	
7.	87	49	16-11	Thresher	
8.	87	45	16-3	----------	
9.	86	--	---	Laborer	
10.	85	---	16-4	Lawyer	
11.	80	53	16-4	Minister	
12.	76	40	16-4	Carpenter	
13.	74	37	16-10	Merchant	
14.	74	41	16-3	Insurance Agent	
15.	69	34	17-4	Probate Judge	
16.	69	43	17	Farmer	X
17.	68	42	16-8	Banker	
18.	66	45	15-10	Real Estate	
19	66	39	17-1	Merchant	
20.	60	---	17-5	Farmer	X
21.	57	40	16-3	Farmer	
22.	53	27	19	Farmer	X
23.	48	29	20-6	Farmer	X
24.	47	24	17	Farmer	X

School: Marion High School

Grade: Sophomore Vocabulary Test: Markham Form I

Sex: Male Intelligence Test: Otis-Self Administering

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	107	60	14-11	School Supt.	
2.	96	58	16-1	Business	
3.	86	53	15	Business	
4.	84	47	15-5	Farmer	
5.	82	52	15-6	Farm Loan	
6.	77	40	17-1	Farmer	X
7.	76	44	15-2	Miller	
8.	76	36	18-9	Business	
9.	73	38	16-11	Farmer	X
10.	71	56	14-10	Farmer	X
11.	67	38	17-8	Farmer	X
12.	66	33	17	Janitor	
13.	64	40	16	Mail Carrier	
14.	64	25	17-6	Minister	
15.	59	34	16	Farmer	X
16.	58	40	17-10	Farmer	X
17.	58	35	17-10	Farmer	
18.	57	21	16	Barber	
19.	55	--	16-11	Farmer	X
20.	55	38	16-11	Depot Agent	
21.	52	35	16-2	Oil Truck	
22.	52	31	16	Business	
23.	51	--	17-7	Salesman	X
24.	49	29	17-8	Farmer	X
25.	45	--	18-10	Truck Driver	
26.	44	--	16-7	Photographer	
27.	36	34	17-11	Farmer	X

School: Marion High School

Grade: Sophomore Vocabulary Test: Markham Form I

Sex: Female Intelligence Test: Otis Self-Administering

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	102	63	14-4	United States Representative	
2.	97	54	15-9	Laborer	
3.	93	45	15-1	Sexton	
4.	90	51	16-1	Business	
5.	88	43	16-4	Hotel (Prop.)	
6.	85	44	15-8	Editor	
7.	83	48	15-5	Farmer	X
8.	81	40	16	Farmer	
9.	76	30	16-11	Laborer	
10.	73	38	17-8	Teamster	
11.	73	38	18-5	Farmer	X
12.	74	48	15-2	Farmer	
13.	69	51	15-7	Farmer	X
14.	67	34	17-11	Laborer	
15.	65	50	17-2	Laborer	X
16.	61	32	17-3	Farmer	X
17.	61	37	16	Truck Driver	
18.	61	42	17	Farmer	
19.	61	32	17-3	Farmer	X
20.	57	39	17-6	Farmer	
21.	57	42	15-9	Farmer	
22.54	33	15-6	Farmer		X
23.	51	40	17	Grain Elevator	
24.	49	25	17-4	Farmer	X
25.	48	30	15-6	Farmer	X
26.	47	37	15-1	Farmer	X
27.	47	27	15-7	Farmer	X
28.	47	27	15-7	Farmer	X
29.	45	23	16	Farmer	X

School: Marion High School

Grade: Freshman Vocabulary Test: Markham Form I

Sex: Male Intelligence Test: Otis Self-Administering

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	98	47	15-2	Paper Hanger	
2.	87	47	15-2	Laborer	
3.	84	56	14-6	Telegrapher	
4.	74	50	16-6	Carpenter	
5.	71	36	14-2	Farmer	X
6.	68	45	15	Hay Buyer	
7.	66	34	16-3	Barber	
8.	61	38	15-3	Farmer	
9.	60	35	14-6	Sales Manager	
10.	59	29	19-11	Laborer	
11.	59	48	17-6	Farmer	
12.	55	32	16-2	Salesman	
13.	59	---	17	Laborer	
14.	51	40	14-2	Kansas Road Commissioner	
15.	48	21	17-5	Carpenter	
16.	42	19	16-6	Farmer	X
17.	42	33	16-3	Laborer	
18.	42	22	18-2	Farmer	X
19.	41	24	16	Farmer	X
20.	40	26	15-2	Doctor (M. D.)	
21.	31	40	14-8	Farmer	X

School: Marion High School

Grade: Freshman — Vocabulary Test: Markham Form I

Sex: Female — Intelligence Test: Otis Self-Administering

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	88	50	14-8	Farmer	X
2.	86	38	17-1	Farmer	X
3.	85	48	14-4	Minister	
4.	71	43	13-10	Farmer	X
5.	70	42	14-1	Farmer	
6.	69	47	14-8	Depot Agent	
7.	67	37	14-9	Farmer	
8.	65	44	14-11	Probate Judge	
9.	61	40	18-10	Farmer	X
10.	61	36	14-2	Farmer	X
11.	59	38	14-10	Contractor	
12.	58	33	13-11	Farmer	X
13.	57	36	15-2	Laborer	
14.	56	33	16-2	Farmer	X
15.	56	28	15-1	Laborer	
16.	54	40	14-8	Mail Carrier	
17.	49	27	15-5	Restaurant (Owner)	
18.	48	24	16	Farmer	
19.	47	29	17-2	Farmer	X
20.	41	35	16-5	Farmer	X
21.	41	32	14	Farmer	X
22.	43	24	16-5	Farmer	X
23.	30	24	14	Farmer	X
24.	28	16	16	Farmer	X

School: Florence High School

Grade: Senior — Vocabulary Test: Markham Form I

Sex: Male — Intelligence Test: Terman Group Test

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	109	222	18-10	Blacksmith	
2.	96	210	17-7	Farmer	
3.	98	209	18	Painter	
4.	93	209	18	Railroad Water Service	
5.	92	217	18-4	Farmer	
6.	90	193	18-5	Oil Laborer	
7.	88	210	18	Farmer	
8.	86	215	19-4	Oil Foreman	
9.	85	203	17-7	Oil Foreman	
10.	85	215	17-4	Carpenter	
11.	80	209	18-1	Farmer	
12.	77	200	18-2	Farmer	
13.	66	--	18-8	Army Sergeant	
14.	63	199	17-6	Carpenter	
15.	50	165	18-9	Oil Worker	
16.	49	186	19-7	Laborer	

School: Florence High School

Grade: Senior Vocabulary Test: Markham Form I

Sex: Female Intelligence Test: Terman Group Test

No.	Vocabulary Test Score	Intelligence TestScore	Age	Parent's Occupation	Rural Elementary School
1.	98	210	17-6	Laborer	
2.	94	213	17-11	Banker	
3.	93	229	18-1	Pipe Line Walker	
4.	82	207	17-3	Farmer	
5.	71	--	18-1	Farmer	
6.	72	194	17-7	Oil Field Laborer	
7.	66	192	18-5	Contractor	
8.	6.	193	17	Blacksmith	
9.	54	168	17	Oil Pumper	
10.	51	165	18-3	Farmer	
11.	50	177	19-8	Restaurant	

School: Florence High School

Grade: Junior — Vocabulary Test: Markham Form I

Sex: Male — Intelligence Test: Terman Group Test

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	103	215	---	Salesman	
2.	83	212	17-3	Mechanic Railroad	
3.	81	199	17-9	Farmer	
4.	74	187	16-3	Painter	
5.	73	187	17-1	Railroad Telegraph Agent	
6.	73	193	17-1	Laborer	
7.	72	198	16-7	Bricklayer	
8.	72	---	19-10	Mechanic	
9.	63	167	18-2	Laborer	
10.	64	173	17	Farmer	
11.					

Sex: Female

1.	99	219	16-10	Railroad Laborer	
2.	91	202	16-3	Merchant	
3.	90	213	---	Physician	
4.	90	210	---	Farmer	
5.	84	196	17	Engineer	
6.	82	224	17-11	Oil Laborer	
7.	67	189	---	Oil Superintendent	
8.	64	174	17-6	Carpenter	
9.	64	172	16-4	Laborer	
10.	59	187	17-8	Oil Foreman	
11.	58	210	17-1	Farmer	
12.	49	185	18-8	Farmer	

School: Florence High School

Grade: Sophomore — Vocabulary Test: Markham Form I

Sex: Male — Intelligence Test: Terman Group Test

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	89	198	16	Mechanic	
2.	85	212	16	Laborer	
3.	73	187	16-6	Engineer, Locomotive	
4.	71	188	16	Manager Elevator	
5.	70	169	16-6	Farmer	
6.	67	169	16-10	Engineer, Locomotive	
7.	61	187	16-8	Physician	
8.	61	173	16-5	Mechanic	
9.	63	172	16-1	R. F. D. Carrier	
10.	59	156	16-5	Farmer	
11.	57	192	17-10	Telephone Service Man	
12.	55	173	15-6	Merchant	
13.	48	172	15-2	Laborer	
14.	45	169	15-4	Farmer	
15.	43	185	15-9	Farmer	
16.	39	147	17-10	Station Agent	
Female					
1.	106	---	15-9	Farmer	
2.	103	208	16-3	Farmer	
3.	96	205	14-6	Laborer	
4.	87	184	16-2	Farmer	
5.	83	200	16-1	Laborer	
6.	81	189	15-11	Laborer	
7.	79	191	16-3	Laborer	
8.	76	195	16-5	Restaurant (Owner)	
9.	75	202	14-8	Laborer	
10.	75	177	16	Mechanic	

School: Florence High School

Grade: Sophomore con't Vocabulary Test: Markham Form I

Sex: Female Intelligence Test: Terman Group

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
11.	69	---	14	Farmer	
12.	65	176	15	Blacksmith	
13.	65	178	16-11	Laborer	
14.	64	170	17	Carpenter	
15.	60	170	17	Laborer	
16.	60	180	15-2	Farmer	
17.	59	170	15-2	Farmer	
18.	43	155	16-6	Farmer	
19.	42	180	16	Laborer	
20.	35	164	16-4	Oilfield Laborer	
21.	72	190	17-2	Oilfield Supt.	

School: Florence High School

Grade: Freshman — Vocabulary Test; Markham Form I

Sex: Male — Intelligence Test: Terman Group Test

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	70	179	---	Laborer	
2.	67	155	15-3	Merchant	
3.	66	170	---	Farmer	
4.	63	179	16-8	Printer	
5.	61	186	15-4	Garage	
6.	59	166	---	Laborer	
7.	58	155	15	Laborer	
8.	57	170	16-6	Farmer	
9.	56	---	14-5	Oil Foreman	
10.	55	---	---	---	
11.	54	175	15-7	Engineer	
12.	53	176	15-0	Laundry	
13.	53	172	15-2	Oil Driller	
14.	48	165	13-11	Farmer	
15.	46	167	15	Farmer	
16.	44	179	15-4	Round House Foreman	
17.	42	159	15	Laborer	
18.	26	139	17-10	Farmer	

School: Florence High School

Grade: Freshman — Vocabulary Test: Markham Form I

Sex: Female — Intelligence Test: Terman Group Test

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.-	88	202	14-1	Farmer	
2.	86	205	16	Supt. of Oil Fields	
3.	84	198	14-4	Railway Conductor	
4.	73	170	16	Telegraph Operator	
5.	73	174	17-11	Foreman	
6.	69	184	---	Freight Agent	
7.	65	174	14-6	Cafe (Owner)	
8.	63	171	15-11	Oil Driller	
9.	61	156	14-8	Farmer	
10.	55	---	14-10	Bridge Contractor	
11.	59	166	15-3	Grocerman	
12.	55	166	17	Laborer	
13.	57	167	14	Farmer	
14	57	162	14-7	Farmer	
15.	51	---	16-7	Oil Driller	
16.	49	184	14-9	Merchant	
17.	44	146	15	Farmer	
18.	42	138	15-11	Farmer	
19					

School: Peabody High School

Grade: Senior — Vocabulary Test: Markham Form I

Sex: Male — Intelligence Test: Terman Group Test

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	102	146	18-8	Merchant	
2.	100	146	17-9	Merchant	
3.	97	139	19-10	Garage	X
4.	91	106	17-8	------	
5.	90	92	18-2	Farmer	
6.	89	136	18	Salesman	
7.	89	110	18-2	Farmer	X
8.	87	106	22-3	Carpenter	
9.	88	110	18-1	Shoemaker	
10.	82	103	18-7	Farmer	X
11.	81	96	17-7	Stockman	
12.	78	88	18-4	Truck Driver	
13.	78	114	18-9	Farmer	
14.	76	63	19-2	Farmer	
15.	75	---	18-4	Salesman	
16.	74	105	---		
17.	66	101	18-7	Farmer	X
18.	50	62	19-2	Farmer	X
19.	47	---	19-3	Oil Fields	

School: Peabody High School

Grade: Senior Vocabulary Test: Markham Form I

Sex: Female Intelligence Test: Terman Group Test

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	112	183	18-3	Baker	
2.	98	107	19-5	Farmer	X
3.	96	154	17-4	Retired	
4.	94	99	16-8	Farmer	X
5.	94	145	19-8	Farmer	X
6.	91	145	16-5	Road Worker	
7.	89	154	18-4	Banker	
8.	88	98	18-4	Farmer	
9.	80	---	16-5	Farmer	
10.	78	---	16-6	Farmer	X
11.	77.	92	18-4	Oil Lease Supt.	X
12.	75	109	17-5	Beauty Parlor	
13.	69	121	17-11	Farmer	X
14.	63	90	18-3	Farmer	X
15.	59	---	19-7	Farmer	
16	56	---	---	Farmer	X
17.	51	73	---	----	

School: Peabody High School

Grade: Junior Vocabulary Test: Markham Form I

Sex: Male Intelligence Test:

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	105		17	Merchant	
2.	103		16-7	Banker	
3.	98		17-3	-----	
4.	98		18-3	Produce Station	X
5.	94		17-5	Teacher	
6.	92		17-1	Garage	
7.	89		18-4	Carpenter	
8.	89		16-8	Farmer	
9.	82		16-11	Farmer	
10.	79		16-10	Farmer	X
11.	78		18-11	Meat Cutter	
12.	75		16-6	Farmer	X
13.	69		17-10	Farmer	
14.	68		18-3	X	
15.	68		16-9	Banker	
16.	62		19-8	Oil Field	X
17.	59		18-2	Librarian	
18.	58		17-6	Farmer	X
19.	53		18-8	Farmer	X
20.	43		17-11	Farmer	X

School: Peabody High School

Grade: Junior — Vocabulary Test: Markham Form I

Sex: Female — Intelligence Test:

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	103		17-6	Farmer	X
2.	96		16-7	Salesman	
3.	93		17-5	Farmer	
4.	90		17-7	Farmer	
5.	85		16-6	Farmer	
6.	83		17-11	Farmer	X
7.	83		17-11	Filling Station	
8.	75		16-4	Farmer	X
9.	75.		18	Physician	
10.	71		17-1	Farmer	
11.	71		17-11	---	
12.	65		18-1	Farmer	
13.	65		18-1	Farmer	
14.	64		19	General Oil Field Manager	
15.	63		18-8	Rig Builder	
16.	62		19-4	Farmer	X
17.	46		18-8	Farmer	X
18.	42		17-4	Farmer	X

School: Peabody High School

Grade: Sophomore Vocabulary Test: Markham Form I

Sex: Male Intelligence Test:

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	84		16-11	Pumper	
2.	83		15-10	---	
3.	81		15-6	Men's Clothing	
4.	78		15-11	-----	
5.	77		17-7	Laborer	
6	77		16-1	Shoemaker	
7.	76		15-8	Rig Builder	
8.	75		15-10	-----	
9.	74		15-7	Farmer	
10.	74		17	------	
11.	72		17-10	Farmer	
12.	71		15-11	Barber	
13.	69		16-6	Motorman	X
14.	65		16-2	Farmer	X
15.	63		16-1	Farmer	X
16	63		16-2	Oil Field Foreman	X
17.	64		16-8	Farmer	X
18.	58		15-7	------	
19.	56		17-8	------	
20.	51		17-8	~~Oil~~-Field	X
21.	42		17-3	Farmer	X

School: Peabody High School

Grade: Sophomore Vocabulary Test: Markham Form I

Sex: Female Intelligence Test:

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	97		16-5	Physician	
2.	88		18-2	Farmer	X
3.	80		15-11	Farmer	X
4.	84		15-7	-----	
5.	84		16-7	Tank Contractor	
6.	79		15-6	Farmer	X
7.	77		15-6	Teamster	
8.	77		15-7	Farmer	
9.	75		15-8		
10.	74		16-2	Grocerman	X
11.	70		15-6	Farmer-	X
12.	69		16	Trucking	
13.	67		16-3	Farmer	X
14.	66		15-2	Farmer	X
15.	64		17	Realtor	
16	61		15-10	Farmer	X
17.	56		17-6	Farmer	X
18.	53		18-4	Farmer	X
19.	53		16-9	Pumper	

School: Peabody High School

Grade: Freshman Vocabulary Test: Markham Form I

Sex: Male Intelligence Test;

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	98		16-9	Farmer	X
2.	82		14-9	Cream Station	X
3.	76		14-10	Farmer	X
4.	75		16-4	Carpenter	
5.	65		15-3	Farmer	X
6.	64		16-2	Farmer	X
7.	64		14-5	Hardward	
8.	61		16-6	Farmer	X
9.	61.		15-6	Farmer	X
10.	60		14-7	Farmer	X
11.	59		13-11	Community Store	
12.	56		16-1	Salesman	
13.					

School: Peabody High School

Grade: Freshman Vocabulary Test: Markham Form I

Sex: Female Intelligence Test:

No.	Vocabulary Test Score	Intelligence Test Score	Age	Parent's Occupation	Rural Elementary School
1.	97		13-7	Oil Field	
2.	94		14-8	Banker	
3.	89		14-9	Odd Jobs	
4.	87		13-11	Baker	
5.	83		13-8	International Harvester Co.,	
6.	82		15-1	Livestock Market	
7.	82		14-5	Farmer	X
8.	80		14-10	Oil Field Pumper	
9.	79		15-2	United Power & Light	
10.	75		15	Oil Contractor	
11.	74		14-8	Farmer	
12.	71		14-11	Cleaner-Tailor	
13.	70		15-5	Farmer	X
14.	69		14-6	Salesman	
15.	69		14-7	Farmer	X
16.	67		14-6	Farmer	X
17.	65		14-3	Farmer	X
18.	62		14-7	Farmer	X
19.	59		15-2	Laborer	
20.	57		14-10	Farmer	X
21.	43		14-11	Farmer	
22.	41		15	Farmer	X
23	40		16-5	Farmer	X

TERMAN GROUP TEST OF MENTAL ABILITY

For Grades 7 to 12

Prepared by Lewis M. Terman, Stanford University, California

EXAMINATION: FORM A

1. Name ..... (First name / Last name)
2. Boy or girl ..... Grade ..... High or Low .....
3. Age last birthday ..... Date of birthday ..... (Month / Day / Year)
4. Name of city (or county) .....
5. Name of school .....
6. Name of teacher .....
7. Date of this examination ..... 19..... (Month / Day / Year)

Do not turn the page until you are told to.

Test	Score	Remarks or Further Data
1. Information		
2. Best Answer		
3. Word Meaning		
4. Logical Selection		
5. Arithmetic		
6. Sentence Meaning		
7. Analogies		
8. Mixed Sentences		
9. Classification		
10. Number Series		
Total		

TEST 1. INFORMATION

Draw a line under the ONE word that makes the sentence true, as shown in the sample.

SAMPLE. Our first President was
Adams Jefferson Lincoln <u>Washington</u>

1 Coffee is a kind of
bark berry leaf root 1
2 Sirloin is a cut of
beef mutton pork veal 2
3 Gasoline comes from
grains petroleum turpentine seeds 3
4 Most exports go from
Boston San Francisco New Orleans New York. 4
5 The number of pounds in a ton is
1000 2000 3000 4000 5

6 Napoleon was defeated at
Leipzig Paris Verdun Waterloo 6
7 Emeralds are usually
blue green red yellow 7
8 The optic nerve is for
seeing hearing tasting feeling 8
9 Larceny is a term used in
medicine theology law pedagogy 9
10 Sponges come from
animals farms forests mines 10

11 Confucius founded the religion of the
Persians Italians Chinese Indians 11
12 The larynx is in the
abdomen head throat shoulder 12
13 The piccolo is used in
farming music photography typewriting 13
14 The kilowatt measures
rainfall wind-power electricity water-power 14
15 The guillotine causes
death disease fever sickness 15

16 A character in " David Copperfield " is
Sindbad Uriah Heep Rebecca Hamlet 16
17 A windlass is used for
boring cutting lifting squeezing 17
18 A great law-giver of the Hebrews was
Abraham David Moses Saul 18
19 A six-sided figure is called a
scholium parallelogram hexagon trapezium 19
20 A meter is nearest in length to the
inch foot yard rod 20

Right .....

TEST 2. BEST ANSWER

Read each question or statement and make a cross before the BEST answer, as shown in the sample.

SAMPLE

Why do we buy clocks? Because
- 1 We like to hear them strike.
- 2 They have hands.
- × 3 They tell us the time.

1 **Spokes of a wheel are often made of hickory because**
- 1 Hickory is tough.
- 2 It cuts easily.
- 3 It takes paint nicely.

2 **The saying, "A watched pot never boils," means**
- 1 We should never watch a pot on the fire.
- 2 Boiling takes a long time.
- 3 Time passes slowly when we are waiting for something.

3 **A train is harder to stop than an automobile because**
- 1 It has more wheels.
- 2 It is heavier.
- 3 Its brakes are not so good.

4 **The saying, "Make hay while the sun shines," means**
- 1 Hay is made in summer.
- 2 We should make the most of our opportunities.
- 3 Hay should not be cut at night.

5 **If the earth were nearer the sun**
- 1 The stars would disappear.
- 2 Our months would be longer.
- 3 The earth would be warmer.

6 **The saying, "If wishes were horses, beggars would ride," means**
- 1 Wishing doesn't get us very far.
- 2 Beggars often wish for horses to ride.
- 3 Beggars are always asking for something.

7 **The saying, "Little strokes fell great oaks," means**
- 1 Oak trees are weak.
- 2 Little strokes are best.
- 3 Continued effort brings results.

8 **A steel battleship floats because**
- 1 The engines hold it up.
- 2 It has much air space inside.
- 3 It contains some wood.

9 **The feathers on a bird's wings help him to fly because**
- 1 They make a wide, light surface.
- 2 They keep the air off his body.
- 3 They decrease the bird's weight.

10 **The saying, "A carpenter should stick to his bench," means**
- 1 Carpenters should not work without benches.
- 2 Carpenters should not be idle.
- 3 One should work at the thing he can do best.

11 **The saying, "One swallow does not make a summer," means**
- 1 Swallows come back for the summer.
- 2 A single sign is not sufficient proof.
- 3 Many birds add to the pleasures of summer.

Right..... × 2 = *Score*.....

TEST 3. WORD MEANING

When two words mean the SAME, draw a line under "SAME."
When they mean the OPPOSITE, draw a line under "OPPOSITE."

SAMPLES	fall — drop	same — opposite	
	north — south	same — opposite	
1	expel — retain	same — opposite	1
2	comfort — console	same — opposite	2
3	waste — conserve	same — opposite	3
4	monotony — variety	same — opposite	4
5	quell — subdue	same — opposite	5
6	major — minor	same — opposite	6
7	boldness — audacity	same — opposite	7
8	exult — rejoice	same — opposite	8
9	prohibit — allow	same — opposite	9
10	debase — degrade	same — opposite	10
11	recline — stand	same — opposite	11
12	approve — veto	same — opposite	12
13	amateur — expert	same — opposite	13
14	evade — shun	same — opposite	14
15	tart — acid	same — opposite	15
16	concede — deny	same — opposite	16
17	tonic — stimulant	same — opposite	17
18	incite — quell	same — opposite	18
19	economy — frugality	same — opposite	19
20	rash — prudent	same — opposite	20
21	obtuse — acute	same — opposite	21
22	transient — permanent	same — opposite	22
23	expel — eject	same — opposite	23
24	hoax — deception	same — opposite	24
25	docile — submissive	same — opposite	25
26	wax — wane	same — opposite	26
27	incite — instigate	same — opposite	27
28	reverence — veneration	same — opposite	28
29	asset — liability	same — opposite	29
30	appease — placate	same — opposite	30

Right..... *Wrong*..... *Score*.....

TEST 4. LOGICAL SELECTION

In each sentence draw a line under the TWO words that tell what the thing ALWAYS has. Underline TWO, and ONLY TWO, in each line.

SAMPLE. A man always has
body cap gloves mouth money

1 A horse always has
harness hoofs shoes stable tail 1
2 A circle always has
altitude circumference latitude longitude radius 2
3 A bird always has
bones eggs beak nest song 3
4 Music always has
listener piano rhythm sound violin 4
5 An object always has
smell size taste value weight 5

6 Conversation always has
agreement persons questions wit speech 6
7 A banquet always has
food music persons speeches toastmaster 7
8 A pistol always has
barrel bullet cartridge sights trigger 8
9 A ship always has
engine guns keel rudder sails 9
10 A debt always involves
creditor debtor interest mortgage payment 10

11 A game always has
cards contestants forfeits penalties rules 11
12 A magazine always has
advertisements paper pictures print stories 12
13 A museum always has
animals arrangement collections minerals visitors 13
14 A forest always has
animals flowers shade underbrush trees 14
15 A citizen always has
country occupation privileges property vote 15

16 Controversy always involves
claims disagreement dislike enmity hatred 16
17 War always has
airplanes cannons combat rifles soldiers 17
18 Obstacles always bring
difficulty discouragement failure hindrance stimulation .. 18
19 Abhorrence always involves
aversion dislike fear rage timidity 19
20 Compromise always involves
adjustment agreement friendship respect satisfaction ... 20

Right.....

TEST 5. ARITHMETIC

Find the answers as quickly as you can.
Write the answers on the dotted lines.
Use the bottom of the page to figure on.

---

1 How many hours will it take a person to go 66 miles at the rate of 6 miles an hour? *Answer* .....

2 At the rate of 2 for 5 cents, how many pencils can you buy for 50 cents? *Answer* .....

3 If a man earns $20 a week and spends $14, how long will it take him to save $300? *Answer* .....

4 $2 \times 3 \times 4 \times 6$ is how many times as much as 3×4? *Answer* .....

5 If two pies cost 66 cents, what does a sixth of a pie cost? *Answer* .....

6 What is $16\frac{2}{3}$ per cent of $120? *Answer* .....

7 4 per cent of $1000 is the same as 8 per cent of what amount? *Answer* .....

8 A has $180, B has $\frac{2}{3}$ as much as A, and C has $\frac{1}{2}$ as much as B. How much have all together? *Answer* .....

9 The capacity of a rectangular bin is 48 cubic feet. If the bin is 6 feet long and 4 feet wide, how deep is it? *Answer* .....

10 If it takes 7 men 2 days to dig a 140-foot ditch, how many men are needed to dig it in half a day? *Answer* .....

11 A man spends $\frac{1}{4}$ of his salary for board and room, and $\frac{3}{8}$ for all other expenses. What per cent of his salary does he save? *Answer* .....

12 If a man runs 100 yards in 10 seconds, how many feet does he run in $\frac{1}{5}$ of a second? *Answer* .....

Right ..... $\times 2 =$ *Score* .....

TEST 6. SENTENCE MEANING

Draw a line under the right answer, as shown in the samples.

SAMPLES	Is coal obtained from mines?	Yes	No	
	Are all men six feet tall?	Yes	No	
1	Does a conscientious person ever make mistakes?	Yes	No	1
2	Is an alloy a kind of musical instrument?	Yes	No	2
3	Is scurvy a kind of medicine?	Yes	No	3
4	Are mysterious things often uncanny?	Yes	No	4
5	Are destitute persons often subjects of charity?	Yes	No	5
6	Are anonymous letters ever properly signed?	Yes	No	6
7	Is the mimeograph sometimes used by stenographers?	Yes	No	7
8	Is a curriculum intended for horses?	Yes	No	8
9	Are proteids essential to health?	Yes	No	9
10	Does " perfunctory " mean the same as " careful "?	Yes	No	10
11	Are premeditated deeds always wicked?	Yes	No	11
12	Do alleged facts often require verification?	Yes	No	12
13	Are sheep carnivorous?	Yes	No	13
14	Are aristocrats subservient to their inferiors?	Yes	No	14
15	Are venerable people usually respected?	Yes	No	15
16	Is clematis sometimes cultivated?	Yes	No	16
17	Are ultimate results the last to appear?	Yes	No	17
18	Are cerebral hemorrhages helpful to thinking?	Yes	No	18
19	Are all people religious who have hallucinations?	Yes	No	19
20	Are intermittent sounds discontinuous?	Yes	No	20
21	Are sable colors preferred for nations' flags?	Yes	No	21
22	Does social contact tend to reduce eccentricities?	Yes	No	22
23	Are tentative decisions usually final?	Yes	No	23
24	Is rancor usually characterized by persistence?	Yes	No	24

Right.....*Wrong*.....*Score*.....

TEST 7. ANALOGIES

SAMPLES

Ear is to hear as eye is to
table <u>see</u> hand play

Hat is to head as shoe is to
arm coat <u>foot</u> leg

Do them all like samples.

---

1 Coat is to wear as bread is to
eat starve water cook 1

2 Week is to month as month is to
year hour minute century 2

3 Monday is to Tuesday as Friday is to
week Thursday day Saturday 3

4 Tell is to told as speak is to
sing spoke speaking sang 4

5 Lion is to animal as rose is to
smell leaf plant thorn 5

6 Cat is to tiger as dog is to
wolf bark bite snap 6

7 Success is to joy as failure is to
sadness luck fail work 7

8 Liberty is to freedom as bondage is to
negro slavery free suffer 8

9 Cry is to laugh as sadness is to
death joy coffin doctor 9

10 Tiger is to hair as trout is to
water fish scales swims 10

11 1 is to 3 as 9 is to
18 27 36 45 11

12 Lead is to heavy as cork is to
bottle weight light float 12

13 Poison is to death as food is to
eat bird life bad 13

14 4 is to 16 as 5 is to
7 45 35 25 14

15 Food is to hunger as water is to
drink clear thirst pure 15

16 b is to d as second is to
third later fourth last 16

17 City is to mayor as army is to
navy soldier general private 17

18 Here is to there as this is to
these those that then 18

19 Subject is to predicate as noun is to
pronoun adverb verb adjective 19

20 Corrupt is to depraved as sacred is to
Bible hallowed prayer Sunday 20

Right .....

TEST 8. MIXED SENTENCES

The words in each sentence below are mixed up. If what a sentence means is TRUE, draw a line under "TRUE." If what it means is FALSE, draw a line under "FALSE."

SAMPLES	hear are with to ears	true	false	
	eat gunpowder to good is	true	false	
1	true bought cannot friendship be	true	false	1
2	good sea drink to is water	true	false	2
3	of is the peace war opposite	true	false	3
4	get grow they as children taller older	true	false	4
5	horses automobile an are than slower	true	false	5
6	never deeds rewarded be should good	true	false	6
7	four hundred all pages contain books	true	false	7
8	to advice sometimes is good follow hard	true	false	8
9	envy bad greed traits are and	true	false	9
10	grow an than strawberries oak tree higher	true	false	10
11	external deceive never appearances us	true	false	11
12	never is man what show a deeds	true	false	12
13	hatred bad unfriendliness traits are and	true	false	13
14	often judge can we actions man his by a	true	false	14
15	in are always American cities born presidents	true	false	15
16	certain always death of cause kinds sickness	true	false	16
17	are sheet blankets as as a never warm	true	false	17
18	never who heedless those stumble are	true	false	18

Right.....*Wrong*.....*Score*.....

TEST 9. CLASSIFICATION

SAMPLES
1 bullet cannon gun sword pencil
2 Canada Chicago China India France

In each line cross out the word that does not belong there.
Cross out JUST ONE WORD in each line.

1	Frank James John Sarah William	1
2	Baptist Catholic Methodist Presbyterian Republican	2
3	automobile bicycle buggy telegraph train	3
4	Collie Holstein Shepherd Spitz Terrier	4
5	hop run skip stand walk	5
6	death grief picnic poverty sadness	6
7	bed chair dish sofa table	7
8	hard rough smooth soft sweet	8
9	mechanic doctor lawyer preacher teacher	9
10	Christ Confucius Mohammed Moses Cæsar	10
11	butterfly hawk ostrich robin swallow	11
12	cloth cotton flax hemp wool	12
13	digestion hearing sight smell touch	13
14	down hither recent up yonder	14
15	anger hatred joy pity reasoning	15
16	Australia Cuba Iceland Ireland Spain	16
17	Dewey Farragut Grant Paul Jones Schley	17
18	give lend lose keep waste	18

Right.....

TEST 10. NUMBER SERIES

SAMPLES	5	10	15	20	25	30	35
	20	18	16	14	12	10	8

In each row try to find out how the numbers are made up, then on the two dotted lines write the TWO numbers that should come next.

1st Row			8	7	6	5	4	3	....
2d Row		3	8	13	18	23	28	....	
3d Row		$11\frac{3}{4}$	12	$12\frac{1}{4}$	$12\frac{1}{2}$	$12\frac{3}{4}$	....		
4th Row			8	8	6	6	4	4	....
5th Row			1	2	4	8	16	32	....
6th Row		4	3	5	4	6	5	7	....
7th Row			16	8	4	2	1	$\frac{1}{2}$	....
8th Row		8	9	12	13	16	17	....	
9th Row	7	11	15	16	20	24	25	29	....
10th Row	31.3	40.3	49.3	58.3	67.3	76.3	....		
11th Row					$\frac{1}{25}$	$\frac{1}{5}$	1	5	....
12th Row			3	4	6	9	13	18	....

Right ..... × 2 = *Score* ..... .

OTIS SELF-ADMINISTERING TESTS OF MENTAL ABILITY

By ARTHUR S. OTIS

Formerly Development Specialist with Advisory Board, General Staff, United States War Department

HIGHER EXAMINATION: FORM A

For High Schools and Colleges

Score.....

Read this page. Do what it tells you to do.

Do not open this paper, or turn it over, until you are told to do so. Fill these blanks, giving your name, age, birthday, etc. Write plainly.

Name..... Age last birthday.....years
First name, initial, and last name

Birthday..... Class..... Date.....192...
Month Day

School or College..... City.....

This is a test to see how well you can think. It contains questions of different kinds. Here is a sample question already answered correctly. Notice how the question is answered:

Which one of the five words below tells what an apple is?

1 flower, 2 tree, 3 vegetable, 4 fruit, 5 animal.....(4)

The right answer, of course, is "fruit"; so the word "fruit" is underlined. And the word "fruit" is No. 4; so a figure 4 is placed in the parentheses at the end of the dotted line. This is the way you are to answer the questions.

Try this sample question yourself. Do not write the answer; just draw a line under it and then put its number in the parentheses:

Which one of the five words below means the opposite of north?

1 pole, 2 equator, 3 south, 4 east, 5 west.....( )

The answer, of course, is "south"; so you should have drawn a line under the word "south" and put a figure 3 in the parentheses. Try this one:

A foot is to a man and a paw is to a cat the same as a hoof is to a — what?

1 dog, 2 horse, 3 shoe, 4 blacksmith, 5 saddle.....( )

The answer, of course, is "horse"; so you should have drawn a line under the word "horse" and put a figure 2 in the parentheses. Try this one:

At four cents each, how many cents will 6 pencils cost?.....( )

The answer, of course, is 24, and there is nothing to underline; so just put the 24 in the parentheses. If the answer to any question is a number or a letter, put the number or letter in the parentheses without underlining anything. Make all letters like printed capitals.

The test contains 75 questions. You are not expected to be able to answer all of them, but do the best you can. You will be allowed half an hour after the examiner tells you to begin. Try to get as many right as possible. Be careful not to go so fast that you make mistakes. Do not spend too much time on any one question. No questions about the test will be answered by the examiner after the test begins. Lay your pencil down.

Do not turn this page until you are told to begin.

Published by World Book Company, Yonkers-on-Hudson, New York, and 2126 Prairie Avenue, Chicago
 OSATMA: HE: A-II

EXAMINATION BEGINS HERE:

1. The opposite of hate is (?)
   1 enemy, 2 fear, 3 love, 4 friend, 5 joy ( )
2. If 3 pencils cost 5 cents, how many pencils can be bought for 50 cents? ( )
3. A bird does not always have (?)
   1 wings, 2 eyes, 3 feet, 4 a nest, 5 a bill ( )
4. The opposite of honor is (?)
   1 glory, 2 disgrace, 3 cowardice, 4 fear, 5 defeat ( )
5. A fox most resembles a (?)
   1 wolf, 2 goat, 3 pig, 4 tiger, 5 cat ( )
6. Quiet is related to sound in the same way that darkness is related to (?)
   1 a cellar, 2 sunlight, 3 noise, 4 stillness, 5 loud ( )
7. A party consisted of a man and his wife, his two sons and their wives, and four children in each son's family. How many were there in the party? ( )
8. A tree always has (?)
   1 leaves, 2 fruit, 3 buds, 4 roots, 5 a shadow ( )
9. The opposite of economical is (?)
   1 cheap, 2 stingy, 3 extravagant, 4 value, 5 rich ( )
10. Silver is more costly than iron because it is (?)
    1 heavier, 2 scarcer, 3 whiter, 4 harder, 5 prettier ( )
11. Which one of the six statements below tells the meaning of the following proverb? "The early bird catches the worm." ( )

    1. Don't do the impossible.
    2. Weeping is bad for the eyes.
    3. Don't worry over troubles before they come.
    4. Early birds like worms best.
    5. Prompt persons often secure advantages over tardy ones.
    6. It is foolish to fret about things we can't help.

12. Which statement above tells the meaning of this proverb? "Don't cry over spilt milk." ( )
13. Which statement above explains this proverb? "Don't cross a bridge till you get to it." ( )
14. An electric light is related to a candle as an automobile is to (?)
    1 a carriage, 2 electricity, 3 a tire, 4 speed, 5 glow ( )
15. If a boy can run at the rate of 6 feet in $\frac{1}{4}$ of a second, how many feet can he run in 10 seconds? ( )
16. A meal always involves (?)
    1 a table, 2 dishes, 3 hunger, 4 food, 5 water ( )
17. Of the five words below, four are alike in a certain way. Which is the one not like these four?
    1 bend, 2 shave, 3 chop, 4 whittle, 5 shear ( )
18. The opposite of never is (?)
    1 often, 2 sometimes, 3 occasionally, 4 always, 5 frequently ( )
19. A clock is related to time as a thermometer is to (?)
    1 a watch, 2 warm, 3 a bulb, 4 mercury, 5 temperature ( )
20. Which word makes the truest sentence? Men are (?) shorter than their wives.
    1 always, 2 usually, 3 much, 4 rarely, 5 never ( )
21. One number is wrong in the following series. What should that number be?
    1 4 2 5 3 6 4 7 5 9 6 9 ( )
22. If the first two statements following are true, the third is (?) All members of this club are Republicans. Smith is not a Republican. Smith is a member of this club.
    1 true, 2 false, 3 not certain ( )
23. A contest always has (?)
    1 an umpire, 2 opponents, 3 spectators, 4 applause, 5 victory ( )
24. Which number in this series appears a second time nearest the beginning?
    6 4 5 3 7 8 0 9 5 9 8 8 6 5 4 7 3 0 8 9 1 ( )
25. The moon is related to the earth as the earth is to (?)
    1 Mars, 2 the sun, 3 clouds, 4 stars, 5 the universe ( )
26. Which word makes the truest sentence? Fathers are (?) wiser than their sons.
    1 always, 2 usually, 3 much, 4 rarely, 5 never ( )

27. The opposite of awkward is (?)
1 strong, 2 pretty, 3 short, 4 graceful, 5 swift..... ( )

28. A mother is always (?) than her daughter.
1 wiser, 2 taller, 3 stouter, 4 older, 5 more wrinkled..... ( )

29. Which one of the six statements below tells the meaning of the following proverb? "The burnt child dreads the fire."..... ( )

1. Frivolity flourishes when authority is absent.
2. Unhappy experiences teach us to be careful.
3. A thing must be tried before we know its value.
4. A meal is judged by the dessert.
5. Small animals never play in the presence of large ones.
6. Children suffer more from heat than grown people.

30. Which statement above explains this proverb? "When the cat is away, the mice will play." ( )

31. Which statement above explains this proverb? "The proof of the pudding is in the eating." ( )

32. If the settlement of a difference is made by mutual concession, it is called a (?)
1 promise, 2 compromise, 3 injunction, 4 coercion, 5 restoration..... ( )

33. What is related to disease as carefulness is to accident?
1 doctor, 2 surgery, 3 medicine, 4 hospital, 5 sanitation..... ( )

34. Of the five things below, four are alike in a certain way. Which is the one not like these four?
1 smuggle, 2 steal, 3 bribe, 4 cheat, 5 sell..... ( )

35. If 10 boxes full of apples weigh 400 pounds, and each box when empty weighs 4 pounds, how many pounds do all the apples weigh?..... ( )

36. The opposite of hope is (?)
1 faith, 2 misery, 3 sorrow, 4 despair, 5 hate..... ( )

37. If all the odd-numbered letters in the alphabet were crossed out, what would be the tenth letter not crossed-out? Print it. *Do not mark the alphabet.*
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z..... ( )

38. What letter in the word SUPERFLUOUS is the same number in the word (counting from the beginning) as it is in the alphabet? Print it..... ( )

39. What people say about a person constitutes his (?)
1 character, 2 gossip, 3 reputation, 4 disposition, 5 personality..... ( )

40. If $2\frac{1}{2}$ yards of cloth cost 30 cents, how many cents will 10 yards cost?..... ( )

41. If the words below were arranged to make a good sentence, with what letter would the second word of the sentence begin? Make it like a printed capital.
same means big large the as..... ( )

42. If the first two statements following are true, the third is (?) George is older than Frank. James is older than George. Frank is younger than James.
1 true, 2 false, 3 not certain..... ( )

43. Suppose the first and second letters in the word CONSTITUTIONAL were interchanged, also the third and fourth letters, the fifth and sixth, etc. Print the letter that would then be the twelfth letter counting to the right..... ( )

44. One number is wrong in the following series. What should that number be?
0 1 3 6 10 15 21 28 34..... ( )

45. If $4\frac{1}{2}$ yards of cloth cost 90 cents, how many cents will $2\frac{1}{2}$ yards cost?..... ( )

46. A man's influence in a community should depend upon his (?)
1 wealth, 2 dignity, 3 wisdom, 4 ambition, 5 political power..... ( )

47. What is related to few as ordinary is to exceptional?
1 none, 2 some, 3 many, 4 less, 5 more..... ( )

48. The opposite of treacherous is (?)
1 friendly, 2 brave, 3 wise, 4 cowardly, 5 loyal..... ( )

49. Which one of the five words below is most unlike the other four?
1 good, 2 large, 3 red, 4 walk, 5 thick..... ( )

50. If the first two statements following are true, the third is (?) Some of Brown's friends are Baptists. Some of Brown's friends are dentists. Some of Brown's friends are Baptist dentists.
1 true, 2 false, 3 not certain..... ( )

51. How many of the following words can be made from the letters in the word LARGEST, using any letter any number of times?
great, stagger, grasses, trestle, struggle, rattle, garage, strangle..... ( )

52. The statement that the moon is made of green cheese is (?)
1 absurd, 2 misleading, 3 improbable, 4 unfair, 5 wicked..... ( )

 Do not stop. Go on with the next page.

53. Of the five things following, four are alike in a certain way. Which is the one not like these four?
1 tar, 2 snow, 3 soot, 4 ebony, 5 coal..... ( )

54. What is related to a cube in the same way in which a circle is related to a square?
1 circumference, 2 sphere, 3 corners, 4 solid, 5 thickness..... ( )

55. If the following words were seen on a wall by looking in a mirror on an opposite wall, which word would appear exactly the same as if seen directly?
1 OHIO, 2 SAW, 3 NOON, 4 MOTOR, 5 OTTO..... ( )

56. If a strip of cloth 24 inches long will shrink to 22 inches when washed, how many inches long will a 36-inch strip be after shrinking?..... ( )

57. Which of the following is a trait of character?
1 personality, 2 esteem, 3 love, 4 generosity, 5 health..... ( )

58. Find the two letters in the word DOING which have just as many letters between them in the word as in the alphabet. Print the one of these letters that comes first in the alphabet.
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z..... ( )

59. Revolution is related to evolution as flying is to (?)
1 birds, 2 whirling, 3 walking, 4 wings, 5 standing..... ( )

60. One number is wrong in the following series. What should that number be?
1 3 9 27 81 108..... ( )

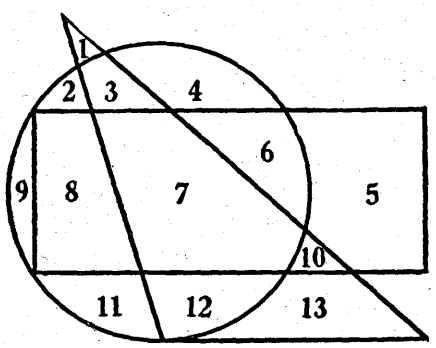
61. If Frank can ride a bicycle 30 feet while George runs 20 feet, how many feet can Frank ride while George runs 30 feet?..... ( )

62. Count each N in this series that is followed by an O next to it if the O is not followed by a T next to it. Tell how many N's you count.
N O N T Q M N O T M O N O O N Q M N N O Q N O T O N A M O N O M..... ( )

63. A man who is averse to change and progress is said to be (?)
1 democratic, 2 radical, 3 conservative, 4 anarchistic, 5 liberal..... ( )

64. Print the letter which is the fourth letter to the left of the letter which is midway between O and S in the alphabet..... ( )

65. What number is in the space which is in the rectangle and in the triangle but not in the circle? ( )



66. What number is in the same geometrical figure or figures as the number 8?..... ( )

67. How many spaces are there that are in any two but only two geometrical figures?..... ( )

68. A surface is related to a line as a line is to (?)
1 solid, 2 plane, 3 curve, 4 point, 5 string..... ( )

69. If the first two statements following are true, the third is (?) One cannot become a good violinist without much practice. Charles practices much on the violin. Charles will become a good violinist.
1 true, 2 false, 3 not certain..... ( )

70. If the words below were arranged to make the best sentence, with what letter would the last word of the sentence end? Print the letter as a capital.
sincerity traits courtesy character of desirable and are..... ( )

71. A man who is influenced in making a decision by preconceived opinions is said to be (?)
1 influential, 2 prejudiced, 3 hypocritical, 4 decisive, 5 impartial..... ( )

72. A hotel serves a mixture of 2 parts cream and 3 parts milk. How many pints of cream will it take to make 15 pints of the mixture?..... ( )

73. What is related to blood as physics is to motion?
1 temperature, 2 veins, 3 body, 4 physiology, 5 geography..... ( )

74. A statement the meaning of which is not definite is said to be (?)
1 erroneous, 2 doubtful, 3 ambiguous, 4 distorted, 5 hypothetical..... ( )

75. If a wire 20 inches long is to be cut so that one piece is $\frac{2}{3}$ as long as the other piece, how many inches long must the shorter piece be?..... ( )